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THE IRON AGE

New York, Thursday, April 6, 1905.

The Hendey Oscillating Milling Machine.

A new line of machines intended for a class of work which cannot be handled with facility on ordinary milling machines, shapers or slotters is the latest product of the Hendey Machine Company, Torrington, Conn. These machines are known as oscillating milling machines, the peculiar feature being that the spindle oscillates instead of rotating. The spindle carries a cutter of special form so supported that the center of the cutter

and feeds, all automatic, $25l_2 \times 5l_3 \times 17$ inches. A front view of the No. 2 machine is given in Fig. 2 and a rear view without the base in Fig. 3, the latter showing clearly the arrangement of the drive and the manner in which the throw of the crank on the driving shaft is altered. The No. 3 machine, which is not shown, has a table surface of 18 x 8 inches and feeds $7l_2 \times 3 \times 8$ inches, of which the vertical feed is automatic.

The machine as put out in the form shown in Fig. 1 resembles in all but the spindle parts the standard No. 4 milling machine made by the Hendey Company. The

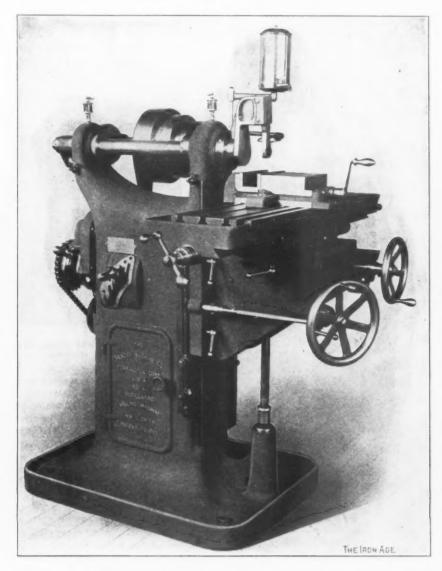


Fig. 1.—The No. 4 Oscillating Milling Machine, Made by the Hendey Machine Company, Torrington, Conn.

coincides with the center of the spindle. The action of the cutter is the same as that of an ordinary milling machine, except that it reverses its motion frequently instead of continually rotating in one direction. The extended bracketlike support allows the cutter to be applied to the forming of slots or the facing of interior parts on castings, such as would ordinarily be cut on shapers with special tools. The new line of machines is at present made in three sizes, Nos. 2, 3 and 4, of which Nos. 2 and 4 are shown among the accompanying illustrations.

Fig. 1 gives a view of the No. 4 machine, the largest size made, which has a working surface of table of 36% x 10% inches, a vise capacity of 6% x 15% x 3% inches,

modifications are found in the working features of the machine, which embody a driving shaft carrying on its end a movable wrist plate and pin, which connects through a hollow connecting rod with an arm on the main spindle. The mechanism may be likened to the feeding motion of an ordinary milling machine, the complete revolutions of the driving shaft imparting the oscillating motion to the main spindle, and the amount of travel being regulated by the adjustment of the wrist plate and pin.

The cutter head may be either a part of the main spindle or a separate fixture, in which case it is centered and held in place by a drawing-in bolt. The cutter itself is made with a suitable shank, which is dovetailed to the cutter head. It is of such a length as to bring the axis of the cutter in true alignment with that of the main spindle. The construction of these parts is brought out in Figs. 4 and 5, which are also interesting in showing two of the typically simple operations of the machine that would be somewhat difficult for any other style of machine.

The cutter is always in contact with the work regardless of the direction of the stroke. Hence the teeth of the cutter are milled radially from the center, with no clearance in either direction, and may be of V shape or a flat form of tooth, which may be ground across its face, giving it a double cutting edge. This latter form is preferred for cutters of large diameter. Work to be slotted must first be drilled out to remove the stock, as would be necessary were the work to be performed on a slotter, for as the cutter does not revolve it cannot clear itself and is therefore not adapted to be worked

ness of the material through which a slot may be cut is about 50 per cent. greater than the diameter of the cutter. Cutters up to ¾ inch in diameter may be used on the No. 2 machine and from % to 3 inches in diameter on the Nos. 3 and 4.

Lake Iron Ore Matters.

The Standing of State Mineral Leases.

DULUTH, MINN., April 2, 1905.—What has a possible bearing on the future of State lands on the Mesaba range is coming up in a suit just institued by the Attorney-General. It grows out of the status of the little sliver of land north of the Sauntry mine, lying like a thin wedge between townships 58 and 59. This was overlooked in the original survey, and when finally adjusted the land was claimed as swamp by the State, under the provisions of its organic act. This claim was fought out and the State

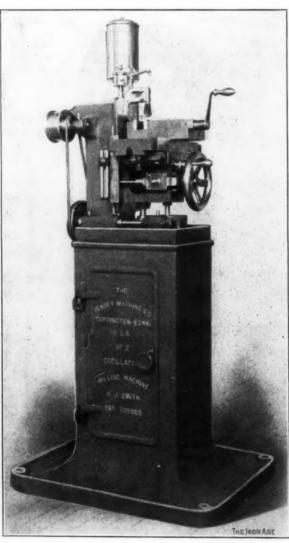


Fig. 2.—The No. 2 Hendey Oscillating Milling Machine.

down into solid material. The relatively high speed of the cutter permits a proportionately fine feed, which prolongs the life of the cutter.

The time taken to finish ordinary slots is on an average about four minutes, depending on the size of the work. A slot in a tool post % x 2 inches, for example, can be cut in four minutes, and the work illustrated in Fig. 5, including the time taken for chucking and finishing both sides of the boss, was done in about four and one-half minutes.

There is no general rule as to the depth of slot which can be cut with a given size of cutter. According to table of dimensions given by the maker a cutter ½ inch in diameter and from 1-16 to ½ inch thick will cut a slot through a piece ¾ inch thick; cutters 1½ to 3 inches in diameter will cut a slot 3 inches deep, and from the average of the range between, it is apparent that the general thick-

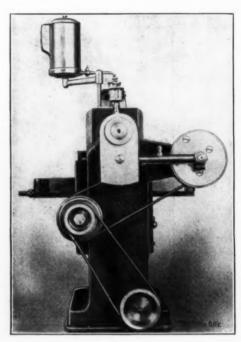


Fig. 3.—Showing Crank and Rocker Arm for Oscillating the Spindle.

won. Upon this it was leased to Mabel Evans, who was later reported to be in the interests of two clerks of the State land office, who by virtue of their positions were not themselves permitted to take State lands. However, Miss Evans holds the lease. The land is supposed to be valuable. It adjoins the opened portion of the Alpena-Sauntry and should contain iron ore. It is not too narrow to make a mine, and is $\frac{1}{2}$ mile long, east and west.

Now comes the State Attorney and enters suit to cancel the Evans lease, and bases his action on two grounds. The first of these is the claim that the lease was taken for the benefit of State employees. This is denied under oath by all connected with the land, and is a matter of but minor moment anyway. The real difficulty with the situation lies in the other aspect of the case, and this may have an unsettling effect on State mineral leases far beyond present intention or expectation. The State constitution, article 2, reads that all State lands shall be sold at public auction. Now, these mineral leases are virtually a sale of the ore in the land and are therefore to be regarded as sales. They are, under the State mineral act, not sold at public auction, but at private sale to the first applicant, and if there is a conflict of applications, not even then at public sale, but at auction between the original applicants. If, therefore, mineral leases are unconstitutionally issued it follows that they must be canceled. This is the position of the State Attorney, but he does not appear to see what will result. If the leases have been unconstitutionally issued and are canceled, the State must refund the money that has been paid for them, the royalties that have been received by it under them, and the fees that have been paid it for 50-year contracts. This would amount to a very large sum. Once before a State Attorney started an investigation of this matter, but when he realized what it meant he dropped the plan. The courts will strain every point to protect vested interests.

The Movement from the Mines.

The upper lake roads have been hauling ore to docks at Duluth, Two Harbors, Superior, Ashland and Marquette for some days. They are taking ore from shafts and nearly all of the daily hoist from many mines on all ranges, but of course nothing will be done at steam shovel mines for some time. No shovels have started

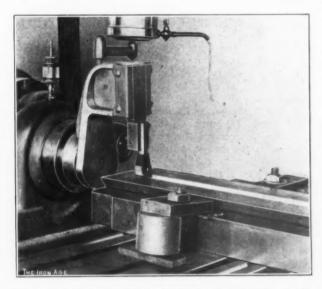


Fig. 4.—A Nearer View of the Tool Head and an Example of the Work It Is Adapted to Do.

and cannot for weeks. In a day or two ships will be at docks for ore and the season of navigation will have commenced. The first vessels to load will be ships of the Tomlinson, United States Steel and Peavey fleets, all of which have boats wintering at Duluth and Superior. During the past month these have been overhauled and put in commission. It is probable that first cargoes will be loaded from the Two Harbors docks of the Duluth & Iron Range road, where there has been no ice for some time. Reports are that the eastern end of Lake Superior and the channels leading to Lake Huron will be ready for shipping during the week. What little ice was formed at the western end of Lake Superior the past winter has gone and there is no possibility of obstruction from this source. There has been no more chartering of lake ships for ore, and the situation is as it has been of late.

Some Important Undertakings.

The Buffalo & Susquehanna Iron Company at its Monro mine, Iron Mountain, is making improvements leading to a far larger output than before. New buildings are going in, new machinery has been placed, and a quantity of stripping is being taken off the ore body, which is to be mined by the milling process. Some ore has been mined during the winter, but the greater part of the work done has been in getting ready for a lively summer. This is the only one of the Buffalo & Susquehanna mines that shows signs of operation.

The Oliver Iron Mining Company at its Mansfield mine, Crystal Falls, is bailing the water out very fast, and in less than 30 days it will be possible to install the big pumps and begin underground drifting. By June the mine should be producing ore at a good rate, unless there are unforeseen hindrances. The company's other mines in that region are busy. At the Corrigan mines of Crystal Falls a great deal of work is going on, and shipments of ore to Escanaba have begun. At Great Western the big cave is being filled from the surface, and the ore that was exposed is being mined beneath the fill, which is settling down as desired. The cave is kept full of waste earth, and as mining goes on below the filling is run down and more is put in to replace it.

This saves the exposed ore and the shaft. Lincoln mine has commenced hoisting ore. Lamont will have its crusher ready and in operation in a week or more. The water is being lowered in the Dunn pit through the drill holes bored to the old workings, though slowly on account of the fact that these holes were not put through to water but were stopped in loose ground and readily become clogged. A second crusher and a new equipment of hoisting machinery are being placed at Tobin mine, which is to be a very large producer this year.

Production of Siliceous and Lean Ores,

The production this year of siliceous, limonitic and other off ores, including lean Bessemers, of the Marquette and Cascade ranges, the sale of which in some quantity was referred to last week, is sure to be far larger than it has been for any preceding year. Ever since the Mesaba range became prominent these ores have been considered valuable, largely as a mix for the low silicon Mesaba, but of late for themselves. They are mostly easily mined, are in large quantities near the surface, and the siliceous Bessemers carry very low percentages of phosphorus, running about 40 to 45 per cent, iron and 35 to 40 per cent. silica, making them excellent for furnace use. They are usually hard and many of them require crushing, plants for which are now going in at several points. It has often been thought that as the supply of high grade ores along Lake Superior became less and less the low grade Mesabas would be utilized. but there are hundreds of millions of tons of these old range low grade ores that will come in long before ore of equivalent units of iron is taken off the Mesaba. This will be true for a number of reasons. In the first place the royalties on these old range mines are usually less than for Mesaba ores, and there is not the tendency to advance these that has been shown on the Mesaba of late. Then the freights are better, as they make a saving of from 60 to 75 cents a ton from the mines to Lake Erie ports. The ores are quite often Bessemer and when crushed are kindly in the furnace. They exist in such quantity and are so placed that they can be mined at very

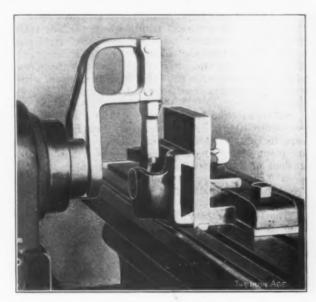


Fig. 5.—Another Example of Difficult Work That Is Easily Done on the Oscillating Miller.

low cost. The Oliver Iron Mining Company is mining one of these properties on the Cascade range by steam shovel, having stripped a few feet of surface off the bed of ore, and others are operated by milling.

D E. W.

At the recent meeting of the National Association of Engine and Boat Manufacturers, New York, the following officers were elected to serve for the ensuing year: John J. Amory, president; H. A. Lozier, Jr., first vice-president; Chas. A. Strelinger, second vice-president; Henry R. Sutphen, third vice-president; J. S. Bunting, treasurer, and Hugh S. Gembel, secretary.

Matters of Interest in Canada.

Port Arthur's Furnace Project.

Toronto, April 1, 1905.—By a majority of 256 votes the ratepayers of Port Arthur approved the by-law embodying the Town Council's agreement with the Atikokan Iron Company. The voting took place March 22. The approval of the property owning citizens does not complete the transaction. A bill has to be introduced into the Provincial Legislature to cover certain points of the contract, for the Municipal act does not give Port Arthur full competence to enter into and carry out some of the specific undertakings of this bargain. If the town simply agreed to pay some named bonus to the company, ratification at the polls is all that would be needed. But in this case the town undertakes to buy and sell the company's bonds.

The agreement is one in which the town of Port Arthur, the Atikokan Iron Company and the Canadian Northern Coal & Ore Dock Company are joined. town agrees to subscribe and pay the par value for \$200,-000 of the bonds to be issued by the Iron Company, but the obligation to subscribe is conditional upon Mackenzie, Mann & Co. taking \$400,000 of the Iron Company's bonds, and J. C. Hunter of Duluth, with others, taking \$100,000—all on the same terms. The bonds subscribed for by these three parties, amounting to \$700,000, together with \$300,000 more which the Iron Company is to issue to pay for its mining properties, making in all \$1,000,000, are to be pooled and deposited with the National Trust Company, which is to hold them at the order of a committee after the blast furnace, coke ovens and roasting plant have been a year in operation. Then these four groups of subscribers may receive back from the Trust Company so much of their respective portions of the \$1,000,000 of the Iron Company's bonds as remains unsold by their committee, receiving cash for the rest of the account.

Besides taking \$200,000 of the Iron Company's bonds, the town agrees to expend \$25,000 to acquire a site for the Iron Company. The location of the site is specified in the agreement, and is to be not less than 40 acres in extent. Further, the works of the Iron Company are to be exempt from all municipal taxation except school taxes and local improvement taxes for 20 years. It is also agreed that the town shall close sections of its streets running through the site. For school taxes the assessment of the Iron Company is to be kept down to \$200,000, whatever improvements or enlargements of its plant may be made.

On its part the Iron Company will at once begin and complete within a year blast furnace works of a daily capacity of 100 tons of pig iron, coke ovens and a roasting plant. It will issue 20-year 6 per cent. bonds to the amount of \$2,000,000, secured by mortgage to the National Trust Company. Its mining properties are held in fee simple, and are described as follows: Atikokan River, E 10, 11, 12.

The Dock Company's part is to construct a coal and ore dock on the water front of the town, with a minimum storage capacity of 200,000 tons of coal and 100,000 tons of ore, the whole to be completed within a year.

Morrisburgh Wants Tin Plate Works.

Another by-law to establish an industry in another town was voted on on the 31st and carried. This was the by-law authorizing the agreement entered into between the municipal authorities of Morrisburgh and the promoters of a tin plate industry there. Only 15 property owners marked their ballots against the agreement, which was therefore carried by an almost unanimous vote. Free power, free water and free light are the privileges the works are to receive. With this by-law went another. which was practically coupled with it, providing for the construction of works to develop electrical power and distribute it to industries. The capacity of the works to be constructed for this purpose is 1100 horse-power. Both by-laws received the same vote. As stated in a previous letter, the concurrence of the Dominion Government is required. It has been secured, the Government consenting to the utilizing of the Cornwall Canal as a

source of power upon certain liberal terms. J. Wesley Allison, the promoter of these Morrisburgh enterprises, is from New York. Associated with him is a Mr. Lewis, understood to have been connected with the inception of the tin plate industry in the United States and prior to that a manufacturer in Wales.

Freight Rates.

In the House of Commons the freight rate question is receiving some consideration this session. been gone into rather fully by the Agriculture Committee, whose chairman, Mr. Gordon, has given much study to the subject. After producing a mass of evidence to show that the rates on agricultural products leaving the country were arbitrary and on many products excessive, the rates on commodities were dealt with. The export rates on these manufactured articles were found to be from 50 to 60 per cent. higher than the import ratesthat is, the American or other foreign manufacturer could send goods to Canadian customers over Canadian railroad lines at rates 40 to 50 per cent. below those exacted from the Canadian manufacturer. Members from the Northwest had something to say about freight rates there. In pursuance of an agreement with the Manitoba Government the Canadian Northern Railway Company a few years ago made a sharp cut on grain. But, according to the representations of one member from that part of the country, the rates on manufactured commodities coming into the country were raised more than correspondingly. On farm implements and kindred goods he stated that the rates had been increased from 10 to 100 per cent. on both the Canadian Northern and the Canadian Pacific. The matter is to be pressed on the attention of the Board of Railway Commissioners.

Apparently, however, the Canadian railroad rates, favorable though they are to manufacturers in other countries, are not considered favorable enough to some of these. Complaint is made of them by Franklin Saunders & Co., Limited, a British tin plate firm. It made its views known by a letter to the Canadian Press Association, an agency subsidized by the Dominion Government to keep Canadian newspapers directly in touch with sentiment in the United Kingdom on all subjects of common interest. Saunders & Co. say they had been notified that the rates on tin plates and kindred lines from Bristol Channel and Liverpool to Canadian ports had been reduced to the same figures as last year. The company's letter proceeds:

But in view of the keen competition from the United States manufacturers, we are anxious to secure a further reduction. It seems to us the carriers can easily meet us in this respect and still leave themselves a fair margin of profit. The rate from South Wales is 24 shillings a ton, to Toronto 23 shillings and 6 pence, and in view of the much shorter haul to Toronto there should surely be room for reduction to the latter point.

We received to-day a letter from one of the largest buyers in Ontario to the effect that they can buy as cheaply from the United States as from us, and considering the convenience of getting their requirements in carloads just as they need, instead of ordering from this side and carrying large stocks, they propose purchasing from the United States this season unless we can offer a sufficient inducement in price to make it worth their while to revert to us. Therefore the urgency of a further reduction of rates is plain.

The United States Steel Corporation.

The following dispatch from Port Colborne, dated March 28, was received and published by Toronto newspapers:

James Gayley, first vice-president of the United States Steel Corporation, accompanied by Messrs. Morrison and Farrell of the same company, arrived here by special train this morning. They were met by Reeve R. Mathews and members of the Town Council, who spent the greater part of the morning pointing out to them the material advantages that this town possesses. They were also taken over what might be termed the ideal Canadian site for a steel plant.

Port Colborne is at the Lake Erie entrance of the Welland Canal. Large expenditures are being made there by the Dominion Government for the better equipment of the port as a traffic point. The improvements are especially designed for facilitating the movement of grain, floating elevators being one element in the plans. Whether there is any idea of bettering the port's accommodations for ore, coke and other material used in iron and steel making is not known.

A St. Thomas newspaper notes that a party of United States Steel Corporation officials passed through the town on a special train over the Michigan Central to visit Port Colborne, Tilsonburg, Port Burwell. St. Thomas, Rondeau and Walkerville in quest of a site for steel works.

The party arrived in Sarnia yesterday. It consisted of 12 persons, officials of the United States Steel Corporation. They were met by a delegation of Sarnia business men, with whom they inspected a property on the water front,

The establishment of a plant of the United States Steel Corporation in Canada would not be an unnatural development. Canada's home market is rapidly expanding, and it has been lately made much less accessible to outside manufacturers of iron and steel. This is due to the adoption of the prohibitive duty on steel rails and to the strict application of the new antidumping clause of the tariff, as well as to some other changes. While outside steel makers are put at the greatest disadvantage by governmental policy, the Government offers the most liberal inducements in the way of duties and bounties for enterprises to launch into iron and steel making within the country. The Steel Corporation could land its ore as cheaply at an Ontario port of Lake Erie as at an Ohio port of that lake. The product of its Minnesota mines is as free to enter Port Colborne as to enter Conneaut Harbor, for there is no Canadian duty on iron ore. Nor is there any on coke. If Canadian works of the Corporation should find the home demand unequal to their output the surplus can be marketed abroad as advantageously as can the product of any of the United States plants. In fact, if the company pleases to make a specialty of manufacturing rails or plates for export it can bring in billets from its American mills, ship out the rolled product and get back all the duty paid on the billets but 1 per cent. As to bounties, it can share in these as liberally as the chief Canadian steel interests, for they import their ore.

Notes.

Mackenzie, Mann & Co. state that an order for 20,000 tons of rails for the James Bay line of their Canadian Northern system has been placed with Bolckow, Vaughan & Co., Middlesbrough, England. The Canadian agent of this British firm is Charles Cassells, Montreal. The contract calls for delivery at the rate of 4000 tons per month, beginning with May and ending with September. Mr. Mann says that the reason for going abroad for the rails is that they will be needed for construction before they can be obtained from Canadian mills. The net duty will be \$4.66 2-3 per ton, one-third of the regular rate being taken off under the preferential clause of the tariff.

Negotiations are well forward for the starting of a shovel and tool factory in Hamilton by American parties, the following names being mentioned in connection with it: Philip Dyer, Easton, Pa.; a Mr. McCarthy and Mr. Elton of New York, and Charles H. Holton, Hamilton. The capital is to be \$250,000.

The Minister of Finance has been applied to to adjust the duty on lead. In Montreal corroding works have recently been built and are about ready for operation. The pig lead, which is the raw material used, is subject to a 15 per cent. duty, while the finished product bears only 5 per cent. It is to redress this inequality that the Minister has been approached.

It is stated that the Sydney rail mill will be turning out product in June.

The new steel plant of the Nova Scotia Steel & Coal Company is expected to be in operation before the summer is past.

C. A. C. J.

In a lecture on lightning rods recently delivered by Sir Oliver Lodge he called attention to a very common error, which is to make the rods of too great conductivity. He stated that a small cross section should be used, and the rod be made of iron rather than copper, as the rod of less resistance passes the current too quickly and produces a shock, due to the inductive effect, besides being liable to side flashes, while a light iron wire causes

the current to leak down more gradually, and perhaps to fuse the wire in so doing, with little perceptible disturbance. A number of conductors are better than one, and may be readily renewed.

The Outlook in the Building Trades.

Special reports to Bradstreet's from 108 cities and towns of varying size in the United States point to an expenditure for new buildings, whether State, municipal or private, during the year 1905, aggregating \$455,000,000, a gain of 15.7 per cent. over the as nearly as can be ascertained actual value of the buildings erected, repaired or enlarged during 1904 at the identical cities.

It might be observed that the greatest expansion shown is that reported in the West. The gain there indicated is 24 per cent., as against a gain of 17 per cent. in the Southern States, 11 per cent. in the middle Atlantic States and 9 per cent. in New England.

It of course should be kept in mind that these estimates are merely given as such, being the best obtainable figures at this time, and are subject to all the usual vicissitudes which may occur as the year advances and which are spoken of at length above. They in fact are a result of a canvass of opinions of builders, contractors, architects and business men generally. Additional returns from other cities—the 108 cities and towns here reported being only a portion of the long list canvassed by Bradstreet's representatives—will undoubtedly swell the aggregate totals, but will not probably materially change the tendencies shown.

The immense expenditure here indicated may be variously regarded. If, for instance, the grand aggregate at 108 cities is to be taken to indicate a country-wide development, some interesting reflections on the total probable expenditure this year for building are possible. If the aggregate of \$455,000,000 is taken to cover, say, three-fourths of the country's total expenditure, a grand aggregate of about \$600,000,000 for building is here foreshadowed. A fair estimate of the cost of an average building is probably 40 per cent. for material and 60 per cent. for labor; but if half is allowed to each of these items a total of \$300,000,000 for material, such as lumber, brick, stone, iron, hardware and paint is possible, and a like sum must be credited to labor. It is hardly necessary to say that the building material markets have for some time past reflected some of the possibilities contained in this expenditure, and the labor market will no doubt also shortly feel the stimulus offered by the putting into circulation of this vast sum of money. That a great impetus has been and will be given to all allied lines of trade and industry goes without saying, and the carrying out of these vast improvements without labor friction would seem to be a vital requisite. Touching upon this it might be added that there is apparently less than ordinary friction perceptible in the building labor market, and all signs seem to favor 1905 being regarded from nearly every point of view as the greatest year the American building industry and its allied trades have ever witnessed.

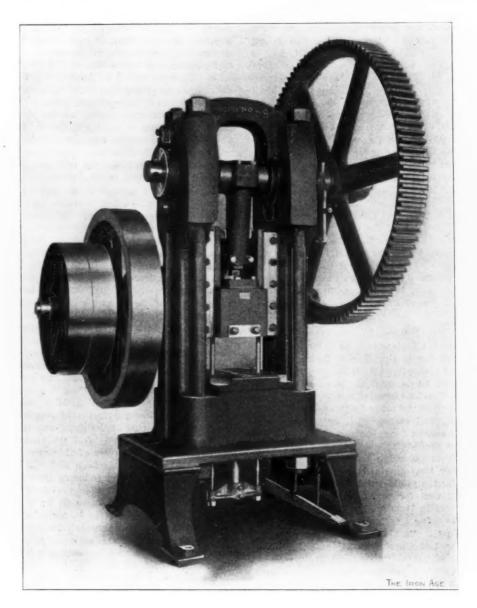
Allis-Chalmers Company to Remove Shops to Milwaukee .- The announcement that the general offices of the Allis-Chalmers Company are to be moved from Chicago to Milwaukee is followed by further statements by officers of the company that eventually all the shops of the company will be located at West Allis, just outside of Milwaukee, and that instead of handling the several departments at long range, as under the old system, with works in three other cities, they will all be concentrated in one place, thus eliminating the necessity of constant traveling to and fro and effecting a great saving in time and expense. These changes will, of course, take time for their completion, but that they will be made eventually is freely admitted. When the shops are located at West Allis the general offices will also be moved from the Clinton street works to the general plant. Plans have already been prepared and the site selected upon the company's own land at West Allis for the office building.

A New Niagara Power Press.

A new power press of the straight sided type, designed for heavy embossing, forming and punching work in the manufacture of automobile parts, drop forge work, &c., was placed on the market a short time ago by the Niagara Machine & Tool Works, Buffalo, N. Y. The machine weighs about 14,000 pounds, and is known as the No. 58 Special. The frame is cast in one piece, with four steel tie rods $3\frac{1}{2}$ inches in diameter shrunk into place to relieve the frame casting of tensile stress. The distance between the uprights is 22 inches. The distance from the bed to the bottom of the slide at the top of the stroke

is 1 to 7\%. Below the bed there is a knockout attachment which ejects the work from the lower die after it is formed.

The fifth annual session of the summer school for artisans, held under the direction of the College of Engineering of the University of Wisconsin, will begin June 26 and continue for a period of six weeks. Courses of study are offered in engines and boilers, applied electricity, mechanical drawing and machine design, materials of construction, fuels and lubricants and shop work. The instructional force is taken from the regular faculty of the College of Engineering, and the entire laboratory



The No. 58 Special Power Press, Built by the Niagara Machine & Tool Works.

and with the highest adjustment is 11 inches. The frame is so designed that the press can be furnished with a long stroke up to 8 inches.

The shaft is 6½ inches in diameter, is made of hammered steel, and has its strongest section at the crank pin. The slide has long guides with V gibs. A ball and socket connection is used for the slide which prevents the adjustment from becoming unlocked while the press is running. The movement of the slide is controlled by a positive clutch of the sliding key type, and a positive stop device causes the crank shaft to stop with the slide at its highest point after each revolution whether the treadle is kept depressed or not. It is therefore necessary to depress the foot treadle for each stroke of the slide unless the positive stop device is disengaged. The gear and pinion are machine cut. The ratio of the gears

and shop equipment belonging to the college will be used by these students in the summer school. It thus offers to those unable to take the regular course an opportunity of obtaining working knowledge of methods of testing and the use of instruments, together with such theoretical principles in each case as the nature of the subject and the preparation of the student may permit. Frederick E. Turneaure is dean of the College of Engineering, Madison, Wis.

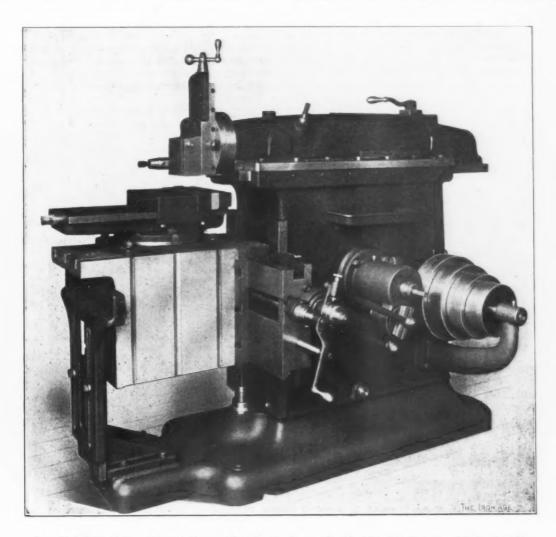
Experiment has demonstrated that when iron at the temperature of the electric furnace passes from the molten to the solid state it increases in volume if it is saturated with carbon. If, however, it is free from carbon, or nearly so, it follows the usual law by increasing in density at the moment of the transition.

The Queen City 24-Inch Shaper.

In *The Iron Age* of September 1, 1904, a 16-inch crank shaper built by the Queen City Machine Tool Company, Cincinnati, Ohio, was described, in the design of which special attention had been given to the providing of ample strength for heavy service. This machine has now been on the market for some months, and has given such satisfaction in actual use that much the same lines have been adopted in the 24-inch shaper illustrated herewith, which has just been brought out by the same company.

The 24-inch shaper is intended for rather heavier work than the 16-inch, and is made only in the back geared pattern, whereas the 16-inch is made either single or back geared. The 24-inch shaper is also furto maintain permanent alignment. The cross traverse is 30 inches, and the screw operating it has a graduated collar. It is at this point that the cam previously mentioned is provided for quick changes of feed without stopping the machine. Vertical adjustment is effected by bevel gears, which are protected from chips and dirt and have ball bearings to minimize the friction.

The rocker arm is connected to the ram by a link, which is set so as to give a straight pull and an even cutting speed, with a very quick return and no lost motion. Adjusting screws are provided to compensate for wear on the crank shoe. The table is readily detachable from the saddle and is provided with an extension which gives a broad clamping surface so that the full length of the stroke may be utilized. A planer type of vise is supplied, which is firmly bolted to the table and arranged



New 24-Inch Back Geared Crank Shaper, Made by the Queen City Machine Tool Company, Cincinnati, Ohio.

nished with a detachable support for the outer end of the table, as shown in the illustration, which is furnished on the 16-inch shaper only on special order. Another feature which is new to the larger shaper is the feed cam on the cross traverse.

The ratio of the back gearing on the 24-inch shaper is 29 to 1, making it possible to derive full benefit from the use of high speed steel tools. The bearing for the ram is 11 x 40 inches, and the ways in which it works are overhung, particularly on the front, to give the greatest possible stiffness. The ram is of a design peculiar to these two new Queen City shapers. It will be observed that it is of arch form, which brings the maximum section into service when the cutting tool is in its extreme forward position, when the leverage on it is the greatest. All of the adjustments of the ram and table are accessible from the working position, and the length of stroke or position of the ram can be changed while the tool is running. The rail is extremely heavy, and has a 9-inch front and 1%-inch top wearing surface

to swivel. Both the table and the head are graduated and can be set quickly and accurately to any angle. The down feed screw on the head is also provided with a graduated collar. The following are the principal dimensions:

Actual length of stroke	
Vertical traverse of table	15 inches.
Cross traverse of table	30 inches
Greatest distance ram to table	17 inches
Feed traverse of the head	71/2 inches
Number of grades to cone	
Number of ram speeds	8
Revolutions per minute of countershaft	330
Net weight of the machine and countershaft	4,400 pounds.

Under the ram there is a large opening through the frame, through which shafts or similar work of great length may be extended when cutting key seats at any distance from either end.

A meeting of the American Institute of Mining Engineers will be held at Washington, D. C., on May 2, 3 and 4.

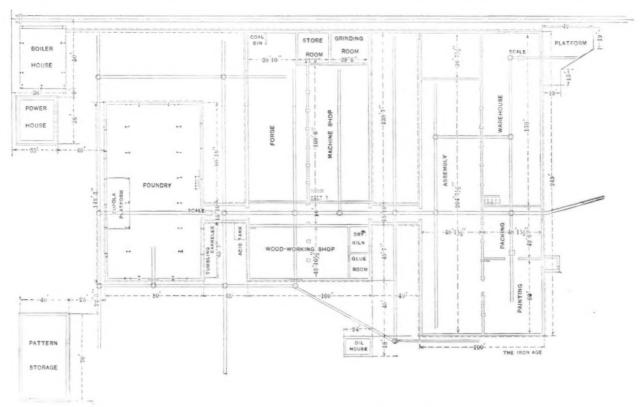
The Plant of the Standard Scale & Supply Company.

The layout of the new works of the Standard Scale & Supply Company, at Beaver Falls, Pa., is given in the accompanying plan. The Standard Scale & Supply Company, Limited, was organized in 1892 as a limited partnership, and securing the foundry and machine shop operated by the Valentine Iron Company in connection with its blast furnace at Bellefonte, Pa., it commenced manufacturing scales with only seven employees. At the outset only the heavier kinds, such as mine, wagon and railroad scales, were made. The business increased very rapidly, and the works at Bellefonte were enlarged as much as possible to meet the growth. Later the manufacture of lighter portable scales except counter scales was taken up. When it was found that the works were too small to care for the constantly increasing trade and did not permit of further enlargement, it was decided to build new and larger works in the Pittsburgh district, to be near the source of raw material supply and to acquire other advantages which that locality offered as a manufacturing center. In the spring of 1903 a site of 8 acres

foot, brick structure, and is isolated for fire protection. Between the power plant and the foundry is a large yard for storing pig iron, coke and other materials, and through it a complete system of tracking extends for receiving and distributing the materials to the various departments.

The foundry is an iron, 80 x 143 foot, building, served by a 5-ton Whiting electric crane and equipped with a cupola also furnished by the Whiting Foundry Equipment Company, space being left for a second cupola. A Craig Ridgway & Son Company elevator is used for hoisting the cupola charges and a Connersville blower provides the blast. In the foundry are barrels for cleaning castings, which are driven by an engine built by the Erie Pump & Engine Company, Erie, Pa., and also tanks in which are pickled castings too large to be rattled.

The forge shop is a 50 x 140 foot fire proof brick building, and contains a tempering and annealing furnace and the usual equipment of forges, hammers, shears and punches, power for the latter being supplied by an electric motor. The wood working shop is 45 x 100 feet, and contains, in addition to the usual complement of wood working tools, a kiln for drying lumber and a glue room. A Milwaukee motor provides the drive for the tools. The



Ground Plan of the Works of the Standard Scale & Supply Company, Limited, Beaver Falls, Pa.

was purchased at Beaver Falls, Pa., about 30 miles from Pittsburgh, having a frontage of about 1000 feet on the main line of the Pittsburgh, Fort Wayne & Chicago Railway. Building operations were begun in April, and the entire works, comprising boiler and power houses, pattern storage, foundry, forge, wood working and machine shops, assembling, painting and packing rooms and warehouse were completed in October, 1903, or in seven months' time.

The power plant is in a fire proof brick building, 31 x 36 feet, and contains two compound Westinghouse engines of 150 horse-power each, direct connected to 75-kw. generators which furnish light and power to the whole plant. The boiler house is a 36 x 50 foot iron building, and contains batteries of boilers of 125 horse-power each, furnished by the Union Iron Works, Erie, Pa. The boilers are equipped with Jones underfeed stokers and slack is used as fuel. An engine driven fan set, built by the American Blower Company, distributes hot air for the heating of the buildings. This and a Cochrane water heater furnishing hot water for the boilers are located in the boiler house.

The pattern storage building is a two-story, 40 x 70

machine shop is 50 x 110 feet, and contains drill presses, double grinders, screw cutting machines, lathes, horizontal drill presses, planers, milling machines, punches, slotters and shapers, all of which are electrically driven on the group system. Adjoining the machine shop is a department wherein the materials are gathered and assembled in the manufacture of small scales.

The assembling department for portable, dormant and wagon scales is contained in a 50 x 240 foot brick building equipped with a number of cranes. All the machinery is motor driven. The lighter scales are assembled in one end of this department and the heavier scales in the other. In the railroad scale department there is a special notching machine for railroad track scale beams and for compound beams for wagon scales. This notching machine is accurate to within 0.0005 inch on the full length of the beam. Another interesting machine is an intricate dividing engine for universal graduation, which will graduate beams for any standard. For example, the American standard may be marked on one side of the beam and the standard of any other country on the other. This machine is largely used on scales for export, as this company has a large foreign trade.

The brass beam department contains a marking machine, grinders, drill press, Gorton double surface disk grinders and surface polishing machinery, all driven by an electric motor. After the scales leave the painting department they go to the packing room, which is in a 40 x 50 foot fire proof building, and thence to the warehouse, which is 50×140 feet. The scales are loaded into the cars from the shipping platform at one end of the warehouse, and the cars are then switched onto the main line of the railroad.

The works have a complete heating system supplied with exhaust steam from the engines. This is used in indirect radiators to heat air, which is distributed through the different buildings by an overhead piping system. The buildings are all connected by bridges, and a complete system of narrow gauge tracks with turn tables extends through all the buildings, affording excellent facilities for the transfer of materials from one department to another. F. B. Gill is president of the company; Wm. H. Black, secretary; John C. Reed, treasurer, and Eugene M. Motchman, mechanical superintendent.

February Iron and Steel Exports and Imports.

Exports of iron and steel and manufactures thereof in February were much larger than those in January, notwithstanding the fact that it was a shorter month. The total value of these exports, excluding iron ore, as given by the Bureau of Statistics of the Department of Commerce and Labor, was \$9,179,124 in February, against \$8,957,989 in January. Taking the commodities for which quantities are given, the February exports foot up 70,429 gross tons as compared with 56,810 tons in January. The February figures, however, were considerably less than those for any of the last three months of 1904, when the exports averaged over 127,000 tons per month. The details for the month and for the eight months of the fiscal year ending with February are given in the following table:

Exports of Iron and Steel. -February -Eight month 1904. 1905. 1904. 1905. Gross tons. Gross tons. Gross tons. Gross tons. . 7,614 3,429 35,384 23,093 Commodities. Pig iron.... 1.443 16 926 9.073 1,685 10,961 20,939 Wire rods..... Steel bars.... 513 703 12,400 8.926 2,449 Billets, ingots, blooms 14,481 26,205 165,618 48.182 Hoop, band, scroll.. 392 Iron rails..... 31 22,211 8,477 314,946 39,98 sheets and Iron platesteel sheets and 476 69 3.092 3.808 plates Tin plates and terne 655 808 40.987 8.362 149 78 5.144 plates 328 plates Structural iron and steel 8,651 2.938 46,742 19,959 Wire 6,580 70,046 8,041 Cut nails..... 5,407 2,353 1.786 21.716 tacks 259 149 2.214 1.597 57.562 Totals 70,429 785.667 284,755

The commodities which showed a considerable gain over January were billets, steel rails and structural iron and steel. The greatest loss was in pig iron. The principal destinations of the steel rails exported in February were South America, which took \$245 tons; Europe, 5711 tons; Central America, 2898 tons, and Japan, 2472 tons.

The total value of the exports for the eight months ending with February was \$85,546,682, against \$67,886,083 in the corresponding period of the previous fiscal year.

The imports of iron and steel and manufactures thereof, excluding ore, show a decrease in value in February as compared with January. The total value for February was \$1,703.073, against \$2,110.815 in January. Turning to the commodities for which quantities are given, the total for February was slightly larger than in January, the figures being respectively 29.472 and 24.337 gross tons. The importations of pig iron in February were practically double those of January. Quite a gain was also made in bar iron, but tin plates showed a falling off of almost one-third. The detailed figures for the

month and for the eight months of the fiscal year ending with February are given in the following table:

Imports of Iron and Steel.

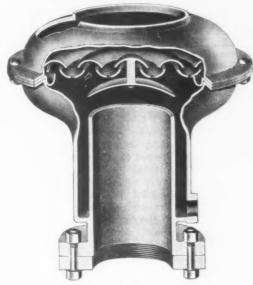
	Legi	uary	-Elght I	months.
	1905.	1904.	1905.	1904.
Commodities. G	ross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	17.134	3,841	61.426	161,776
Scrap	1,153	316	7,404	21,177
Bar Iron	3,581	706	16,230	24,248
Rails		7,943	7.996	32,594
Hoop, band and scroll	22	82	1.584	1.577
Billets, slabs, bars,				
&c., steel in forms.				
n.e.s	809	1.514	6,366	88,714
Sheets and plates	108	1,031	1.350	8,854
Tin plates and terne				
plates	5,194	3,214	48,981	30,528
Wire rods	1.163	1,700	9,818	13,451
Wire, and articles				
made from	254	325	2.317	3,502
Structural iron and				
steel*	31	1,512	1,871	10,926
Chains	11	35	201	244
Anvils	12	18	99	188
Totals	29,472	************	165,643	397,779

^{*} Included in " All other" prior to July 1, 1903.

The total value of the imports of iron and steel and manufactures thereof, excluding iron ore, was \$14,343,904 in the eight months of the fiscal year ending with February, against \$19,447,258 in the corresponding period of the previous fiscal year.

The Greenaway Exhaust Head.

In many places it is desirable to dispose of the exhaust steam from a heating or power plant in a building above the roof line, and under such conditions it is equally desirable that the steam which escapes shall be thoroughly dried and that the condensation shall be precipitated before it escapes. With a view to supplying



The Greenaway Exhaust Head.

an apparatus to insure this result the Greenaway Company, Majestic Building, Detroit, Mich., has placed on the market the cast iron exhaust head shown in the engraving herewith. It will be seen that the main exhaust pipe discharges into a special head, with provision for the condensation to be carried off by means of a pipe connected at one side of the water chamber near the bottom. The steam in arising strikes the baffle plate surrounded by a number of concentrically arranged baffle plates, providing additional cool surface for the steam to come in contact with and cause its condensation before the escape. It is pointed out that being made entirely of cast iron it is well calculated to stand the ravages of time and the corroding effect of the steam passing through it. It is also pointed out that when an exhaust head works perfectly there is no spraying of the pure water of condensation on the roof to cause rotting away or the shower that comes from the condensation of the steam in the atmosphere.

A Quick Change Micrometer Caliper.

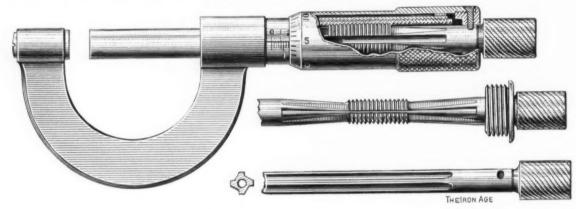
An ingenious improvement to a micrometer caliper for quickly setting it approximately at any diameter within its range has been patented by C. A. Fiske, 161 East Sixty-seventh street, New York City. The usual manipulation in changing the setting from a small diameter to a considerably larger one is slow and somewhat laborious, as it requires many turns to travel the screw plunger any distance. This objection has been partly mitigated in some calipers by providing on the end of the handle a projecting knurled knob of smaller diameter than the handle, making it possible to turn the screw much faster than before, but even with this the process is slow compared to the setting of the caliper herewith illustrated.

In exterior appearance the caliper is of the usual construction. The only difference in the interior is to be found in the screw and the part that it contains, which for convenience are shown removed in the engraving. That part of the plunger normally within the handle is hollow, and has longitudinal slots cut through the shell 90 degrees apart, leaving the screw in four quadrant segments. The metal on each side of these screw segments is reduced in thickness, giving it the character of a spring, and the normal tendency for the screw is to collapse, withdrawing its threads, as shown in the detail. The lower view shows the form of the fluted rod that extends inside

Olcott. From the membership of the American Society of Mechanical Engineers: John E. Sweet, Robert W. Hunt, Samuel T. Wellman, James M. Dodge. From the membership of the American Institute of Electrical Engineers: Carl Hering, Charles P. Steinmetz, Charles F. Scott, B. J. Arnold. The medal is of gold of the value of about \$100 and with it is presented a certificate of the award. The medal was awarded to Lord Kelvin for "Cable Telegraphy and Other General Scientific Achievements."

The Dunderland Iron Ore Company.

The London *Times* has been informed of the progress being made in the works of the Dunderland Iron Ore Company. This company was established in April, 1902, for the purpose of utilizing by a new method of treatment the deposits of magnetic and specular iron ores situated at Dunderlandsdalen, on the west coast of Norway. These deposits have been neglected so far because the ore, though easily quarried, contains but a low percentage of metallic iron, and is too lean and phosphoric to be shipped in a crude state. The company, however, propose to put into operation a series of processes by which the crude ore is finely crushed, the iron contents separated magnetically from the gangue and the



A Quick Change Micrometer Caliper.

the screw, and is allowed a rotative movement within it of one-eighth of a turn, or sufficient at one extreme to allow the ridges on the rod to project through the slots in the screw shell and at the other extreme to expand the screw, raising its threads to engage the nut in the barrel of the tool. The assembled view where it is broken away shows the screw in its engaged position, and also shows the manner in which the handle, screw stem and fluted rod are held in relation by a small set screw.

In use the micrometer caliper is handled in the ordinary way for the final adjustment of a reading and for slight changes in setting may be screwed out or in by rolling the projecting knurled knob between the thumb and finger. Radical changes in setting are made by twisting the smaller knurled knob while holding the knurled handle. This rotates the fluted rod, allowing the threads on the screw to recede from the nut, and leaves the plunger free to be moved instantly to any other position. Then by turning the knurled knob back again the threads are restored to contact with the nut and the final adjustment is made.

The Fritz Medal Awarded to Lord Kelvin.—The first award of the John Fritz Medal, which was established by the professional associates and friends of John Fritz of Bethlehem, Pa., on August 21, 1902, his eightieth birthday, to perpetuate the memory of his achievements in industrial progress, has been awarded to Lord Kelvin. This award was made by the following board selected for the purpose: From the membership of the American Society of Civil Engineers: Robert Moore, Alfred Noble, Chas. Warren Hunt, Chas. Hermany. From the membership of the American Institute of Mining Engineers: E. G. Spilsbury, James Douglas, Charles Kirchhoff, E. E.

phosphorus so far as possible eliminated. The low grade ore is thus converted into a concentrate, which in the form of briquettes is estimated to contain about 65 per cent. of metallic iron and not more than 0.03 of phos-Although no contracts for the supply of ore from Dunderlandsdalen have yet been entered on, a number of English iron making companies and firms have expressed their willingness to become customers as soon as shipments can be made. As to this point, we are informed that supplies of the briquettes may shortly be expected on the market. The mines are in course of being opened out, and a considerable quantity of ore has already been quarried. It is estimated by Mr. Simpkin, the company's engineer, that the whole of the machinery and plant for crushing and drying the crude ore should be ready to work by June; that a sufficient part of the plant for the magnetic separation to treat 1500 tons of ore per day as a beginning should be completed by July, and the remainder about October, and that one-third of the briquetting furnaces and plant should be completed by about August, and the whole of the works completed by the end of this year, when an output at the rate of 750,000 tons per annum should be reached. Meanwhile, it is stated, a harbor at Guldsmedvik has been dredged, piers built and the railway from the piers to Storfoshei, where is situated the crushing and concentrating plant, and from there to the iron ore mines has been constructed and is now in operation.

India, which at one time produced all the diamonds in the world, now produces less in an entire year than are recovered at the De Beers mines in the Transvaal in one hour. The present garnet production of India has four times the value of its diamond crop.

The Modern Steam Fire Engine.*

BY F. F. LOOMIS.

The steam fire engine dates back to 1840, when the first engine was built by P. R. Hodge, mechanical engineer, of New York. The engines were horizontal, attached to a tubular boiler of the locomotive type. The pistons of the steam and water cylinders were on the same rods, and the connecting rods were attached to cranks on the hind wheels, which served as balance wheels when the rear end of the engine was blocked up ready for service. This machine was also a self propeller; an early automobile. The pumps were single acting and carried two suction connections-one for each end-and two discharge gates. This engine worked very well, but was of small capacity, weighing only 3000 pounds. In 1852 A. B. Latta built the next engine for the city of Cincinnati, and upon trial it proved far superior to any mechanical device that had been designed to handle water for fire service.

The requisites for a modern steam fire engine are many and varied. It is essentially a portable apparatus. The question of economy of operation and efficiency must be thrown aside, for the one object is to get the greatest amount of water on a fire with the least weight of apparatus. The boiler must be designed and constructed to contain a great amount of heating surface and but little water, so as to generate steam in the shortest time possible from cold water and yet be substantial. During tests a pressure of 60 pounds of steam has been raised in three minutes, but in practice it is more often six minutes, for the reason that during tests the water is drawn dangerously low in order to lessen the amount of water that must be heated. The designs of boilers that best fulfill these requirements at the present time are what are known as the nest-tube smoke flue type with a false head in the top to keep the upper end of the smoke flue submerged and the water tube type with no smoke flues. There is also a new spiral water tube boiler, which appears to be a good steamer. The grate area is necessarily small, and therefore they are a little wasteful of fuel, requiring close attention in firing and the best of fuel, especially when developing 40 horse-power at the nozzle. with a grate containing 4.94 square feet and a boiler 65 inches long and 341/2 inches outside diameter.

The engines are what are known as a double engine, at least such are the late designs, and are direct connected to the pump pistons. A yoke and a short connecting rod turn a crank shaft carrying a fly wheel or balance wheel and the eccentrics for operating the slide valve, which is usually of the well-known D pattern. The valves are always made with but very little lap, and the balance wheel is so light that there is not momentum enough to carry the engine over the center and thus keep a steady motion. The engine takes steam for about seven-eighths of the stroke, therefore very little of the expansive effect of steam is obtained, and it is impossible to get the high efficiency of good automatic engines. The pistons are made of the split ring pattern and give good satisfaction. The power of a fire engine is usually reckoned from the hydraulic effect actually accomplished—that is, the vertical hight to which a stream can be thrown and the quantity of water delivered and the efficiency by the power consumed.

During tests I have made at different times we have obtained 80 to 85 per cent. of the power developed in the cylinder in work at the nozzle through 100 feet of 2½-inch hose and a 1¾-inch smooth nozzle. It will be seen that the engineer in designing such an engine is brought face to face with a good many difficulties, such as keeping down the weight and size and making everything compact yet accessible for repairs. I believe he has done this work very well when we consider that an engine and pump capable of developing 40 horse-power does not occupy a space to exceed 2 x 3 x 5 feet.

The pumps are double and are double acting. Castings and most other parts are made of compositions. The plungers in some are made solid, but the best are provided with leather buckets. In other makes the barrel

is fitted with a gland and packing and a long, hollow plunger. This is a very good construction for bad, sandy water, as wear can be taken up easily. The valves are of the round, flat rubber type, with springs on the back. These are 3½ inches in diameter, ½ inch thick and are usually arranged radially around each end of the barrel of the pump, as close together as possible to economize space. The pump referred to has a 4½-inch bore and 8-inch stroke. To get the rated amount of water through such a pump—900 gallons a minute—the pump must have a very rapid motion and no pressure on the forcing side or open butts.

During a test of a pump of this size with two lines of 2½-inch hose discharging into one 25-foot section of 3-inch hose and 95 pounds pressure at the engine, the stream reached a horizontal distance of 200 feet with a 1½-inch nozzle, and delivered 493 gallons of water with an engine speed of 208 revolutions per minute. Theoretically it should have done this at 200 revolutions per minute, but the difference was lost through slippage. This pump cannot be worked up to its rated capacity against a heavy pressure, but a speed sufficient to deliver 600 gallons a minute, which would be 250 revolutions a minute can be maintained. Valves seated as often as that in a minute against 200 pounds pressure must be made of the very best material in order to be reliable.

Vacuum chambers and air chambers must be very liberally proportioned in order to run without hammering or pounding. The suction also should be liberal, never less than the bore of the pump. Larger sizes would be better, but the suction must be portable so as to be easily and quickly handled. The elasticity of air was shown during a test of this engine, in which the lift was 14 feet 6 inches. Theoretically the engine should have made 4.81 revolutions to displace the contents of the suction and pump barrels, but it actually took 29 revolutions before the water reached the pump. This test was repeated several times with the same results. The pump was in first-class condition, as it afterward raised the water the full length of the suction.

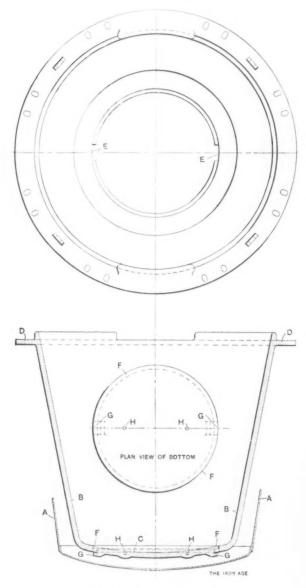
It is not all to the boiler, engine and pumps that good results are due. Much depends upon the nozzle used and these are sometimes deceiving. For instance, a man stated that he handled two 11/4-inch streams during a certain test and the other fellow only handled two 11/8 inch streams. Investigation showed that the two 11/4-inch nozzles were of the ring variety and the two 11/8-inch were smooth bore tips and delivered 268 gallons each with 75 pounds pressure at the tip and with rubber hose, and the stream reached a horizontal distance of 169 feet. On the other hand the 114-inch ring nozzles delivered but 259 gallons each and reached 166 feet with the same lines of hose. There is such a thing as getting too much pressure on a tip for the best results. For instance, during tests that have been made a %-inch stream in still air at 86 pounds pressure has reached a perpendicular hight of 100 feet. Now, if the pressure is increased to 130 pounds the hight decreases to 75 feet, but if the stream is increased to 34 inch and the pressure maintained at 86 pounds the distance increases to 116 feet, and for the 1-inch nozzle, 137 feet; the 11/4-inch, 150 feet; the 115-inch, 158 feet; the 134-inch, 166 feet, and the 2-inch, 169 feet. Thus the same pressure that sends the 54-inch stream 100 feet sends the 2-inch stream 69 feet farther. On the other hand, the 130 pounds that cuts down the %-inch to 75 feet sends the 2-inch stream 230 feet high, which is an increase in hight of 155 feet and represents 900 per cent. more water.

Experience has shown that the %-inch stream with 130 pounds pressure reached 75 feet. If the pressure were cut down to 45 pounds it would reach the same hight. Thus to get the best results it is necessary to know what is required and then select the size tip and proper pressure to accomplish it. Deviating either way cuts down the distance. To give all the data and value would require a very extensive table, but enough has been given to show that the modern steam fire engine should be handled judiciously. The engineer must necessarily be a man of practice rather than versed in theory, and better still if he has both.

Abstract of a paper presented before the Ohio Society of Mechanical Engineers and Steam Engineers.

The McDonald Cinder Ladle.

It is the modern practice to fit the ladles of cinder cars with a cast iron lining known as a thimble. Thimbles are usually made with removable bottom plates, which are customarily attached to the ladle by bolts. The objection to this manner of fastening the bottoms is that the iron in the cinder soon cuts away the heads of the bolts, and through the holes left open as the bolts fall out the iron is led directly to the steel ladle, soon destroying it. To overcome this defect Thomas McDonald, general superintendent of the Ohio Steel Works of the Carnegie Steel Company, at Youngstown,



The McDonald Cinder Ladle.

Ohio, has invented a removable bottom, which is secured to the thimble without bolts or other loose parts.

The accompanying illustration shows a vertical section and a top view of a cinder ladle thimble with a removable bottom and a plan view of the bottom as constructed according to the McDonald patent. Referring to the illustration, A is the outer steel shell or ladle proper, B is the cast iron lining or thimble and C the removable bottom plate. The thimble is secured to the outer shell in the usual manner by bolting the flange D to a corresponding flange on the shell. In the bottom of the thimble recesses E are cut into the circumference of the opening. The removable bottom C is supported on the bottom of the thimble B by its flange F. lugs G on the under side of the plate correspond to the recesses in the bottom of the thimble, and are small enough to pass through them when the bottom is nut in place. Then turning the bottom C to the right or left by a spanner fitting into the holes H, the bottom may be securely fastened to the thimble, the lugs G and the flange F straddling the edge of the opening in the bottom of the thimble.

The particular form of construction shown is subject to considerable variation. The claims of the patent cover any method of securing removable bottoms to thimbles in cinder ladles without attaching them to the ladle proper.

Improvements at Youngstown, Ohio.

Nearly every manufacturing plant, large or small, located at Youngstown, Ohio, in the Mahoning Valley, is enjoying a period of unusual prosperity. Most of the manufacturers find their present capacity inadequate to keep up with demand and as a result many are about to make material additions, while others are preparing to erect new works for the manufacture of additional lines of product. The largest plant in Youngstown is the Ohio Works of the Carnegie Steel Company, which at the present time is melting about 2200 tons of Bessemer pig iron per day and turning out about 2000 tons of steel daily. Some material additions are contemplated to this plant which will considerably increase its capacity. Connected with the Ohio Works are four blast furnaces, each turning out from 500 to 600 tons of metal a day.

The next largest interest in the Mahoning Valley is the Republic Iron & Steel Company, which has three rolling mills in Youngstown and two blast furnaces and a large Bessemer steel plant. The Republic Company is making some improvements and additions to equipment in these rolling mills and has started the building of a new blast furnace at Haselton. At the Bessemer plant the Republic Company has nearly completed the installation of an interchangeable mill for rolling rails, sheet and tin bars. It is understood also that the Republic Company contemplates the building of other finishing mills in connection with the Bessemer plant to turn out new lines of product and these may possibly embrace rod and wire mills. The Bessemer plant of the Republic Company is making some excellent records and is turning out from 1600 to 1800 tons of steel per day.

The stockholders of the Youngstown Iron, Sheet & Tube Company at a meeting held on Tuesday, March 28, confirmed the action of the Board of Directors in recommending an outlay of \$2,500,000 for the building of a Bessemer steel plant. It is probable that in addition to building a steel plant the Youngstown Iron. Sheet & Tube Company may build a rail mill and a large plate mill, although this has not been definitely decided. This company has about completed the installation of additional skelp mills and is now prepared to make pipe up to 12 inches in diameter. The Youngstown Car Mfg. Company is building large additions to its plant, 89 x 200 feet, and will take up several new lines of iron and steel manufacture. The William B. Pollock Company, builder of iron and steel plate work of all descriptions, blast furnaces and rolling mills, is making an addition to its foundry which will about double its capacity. The Youngstown Iron & Steel Roofing Company, maker of black and galvanized iron and steel sheets, has recently added another mill to its equipment, and has made other additions which will very materially increase its output. The General Fire Proofing Company of Youngstown, manufacturer of allsteel furniture and filing equipment, "herringbone" steel lath and other expanded steel products, has more than doubled the size of its plant since it was organized The Enterprise Boiler Company at four years ago. Youngstown has also recently enlarged its plant and considerably increased its capacity. There never was a time in the history of the manufacturing business when the various industries at Youngstown were in a more prosperous condition than at present.

A cable dispatch from Victoria Falls, South Africa, announces that the bridge over the Zambesi River, the highest bridge in the world, was connected on April 1, thus making another link in the chain of the Cape-to-Cairo Railway. The bridge is of the cantilever type, and is 420 feet above the river at low water.

Bliss Coin Rolling Mills.

The various machines for making coins in the United States Mint were supplied for many years by the Orr & Hess Company until about two years ago, when the concern was bought out by the E. W. Bliss Company, Brooklyn, N. Y. Since that time much of the machinery formerly made by the Orr & Hess Company has been redesigned and modernized. The accompanying illustrations show two rolling mills recently redesigned, Fig. 1 being a breaking down mill with 10 x 9 inch rolls specially intended for rolling ingots to nearly the correct thickness, and Fig. 2 a finishing mill.

with each revolution or the indicator finger 1-16 inch. The rolls are of high grade iron.

The finishing rolling mill, as illustrated in Fig. 2, is usually furnished with the breaking down mill. In rolling metal for coining purposes uniform density and pre-

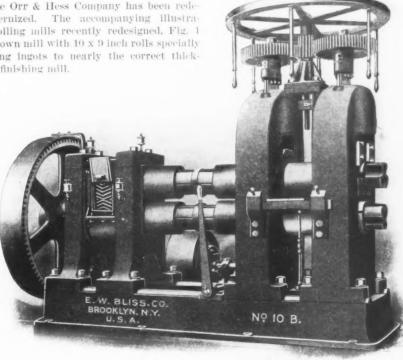


Fig. 1.—The Bliss Breaking Down Mill for Rolling Coin Ingots to Nearly Correct Size.

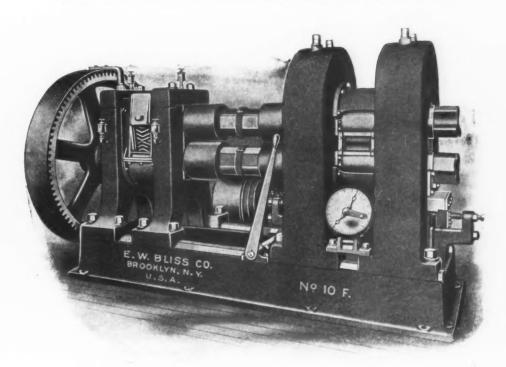


Fig. 2.—The Bliss Final Finishing Coin Rolling Mill.

The gearing in the breaking down mill is all cut from the solid and helical pinions of steel are used on the roll shafts. The latter give the best results in rolling metal, as they avoid wavy surfaces on the face of the rolled strips such as often result when cast spur gears are used. The upper roll may be adjusted with great precision, the adjustment being quickly set by means of the large hand wheel which moves the rolls 1-32 inch cision are required so that each blank will be of proper hight. It is therefore necessary for the rolling process to be absolutely perfect, and the best results are obtained by using the finishing mill. This mill is fitted with an adjusting wedge under the lower roller bearings by which it can be quickly set to within 0.025 inch, the exact adjustment being indicated by the dial. Ten revolutions of a crank handle, which is not shown, moves the long

pointer ten spaces on the dial, moves the short pointer one space and raises the roll 0.001 inch. When the ratio is to be changed the front stop is pulled out of the dial, and by turning the crank five times, moving the pointers five spaces, the roll is raised 0.01 inch.

As ordinarily fitted the rolls are belt driven through a powerful friction clutch, but if desired a 50 horse-power electric motor is attached to them for direct driving.

Tin Deposits of Alaska.

Geological Survey Report on Developments in 1904.

Washington, D. C., April 4, 1905.—The recent development of Alaskan tin deposits is the subject of an interesting special report to the United States Geological Survey by Arthur J. Collier, who has made an exhaustive study of this field. Mr. Collier visited these deposits in 1903 and prepared a report upon them for the Survey that attracted a great deal of attention. economic importance of the subject was so promptly recognized that he was commissioned to make a careful examination of the field in 1904 to determine, if possible, the extent of the deposits and to record the development work of the season. Through the courtesy of Dr. Alfred H. Brooks, in charge of the Division of Alaskan Mineral Resources, the correspondent of The Iron Age is enabled to present an advance abstract of Mr. Collier's report.

The tin deposits of Alaska which give promise of economic importance are situated in what is known as the York region, which comprises the western end of Seward Peninsula, though tin in small quantities is much more widely distributed. The tin ore of the York region occurs both in lodes and placers, distributed over an area of about 450 square miles. Stream tin was discovered in the gold placer mines of the Anikovik River, near York, in 1900, since which time prospectors have found the ore at many other localities.

Lode Deposits.

The prospecting and development of mineral bearing lodes are necessarily slow and expensive as compared with the rapid development of the placers, and it is scarcely reasonable to suppose that the work which can be done in a short Alaskan season will be sufficient to demonstrate their value. On the other hand, lode deposits have the advantage over the placers that they can be worked throughout the whole year in Alaska as well as in any other part of the world. During the season of 1904 development work on tin lodes was in progress at Lost River and Cape Mountain, and new discoveries of tin lodes are reported at Brooks Mountain, Ears Mountain and in the Darby Mountains, all in Seward Peninsula.

Lost River, which enters Bering Sea 25 miles east of Cape Prince of Wales, rises near Brooks Mountain, about 12 miles from the coast, and flows southward. The tin lodes of the Lost River basin are on two tributaries known as Tin Creek and Cassiterite Creek, which flow into Lost River from the east side about six and seven miles, respectively, from the sea. Most of the development work has been done on Cassiterite Creek. The country rock of this whole basin is limestone, with some intruded dikes and stocks of granite and granite porphyry. Tin ore was discovered here in 1903 in connection with a granite porphyry dike, which extends from the hillside above Cassiterite Creek across the mountain to Tin Creek, a distance of one mile.

A group of claims located along this dike, which was called Cassiterite Lode, was bonded in 1903 to capitalists, who in 1904 sent a well equipped expedition to examine the claims. Active development was carried on for about a month, when the work was abandoned. Other bodies of ore, which were exploited late in the season, have been found by the original locaters for several hundred yards northwest of the original discovery.

The general result of the work done on Cassiterite Creek during the past season is to demonstrate that there is an ore body about 60 x 15 feet in the west end of the

dike known as Cassiterite Lode. This ore body was systematically sampled as far as developed, but the exact average of the assays made has not been reported and its extent in depth has not been tested. East of this ore shoot the dike probably does not contain sufficient tin to be of value. The limestones surrounding the west end of the dike contain several small but well defined veins of very rich ores, and in places are so filled with minute veins as to become practically a stock work ore body. The bond under which most of the work was done last summer covered only a part of the ground on which tin ore has been found, and work was suspended because the bonding price was evidently too high in the light of these developments. The original locaters who remained on the ground worked one of the small veins late in the season and produced and shipped to Seattle 12 tons of ore, estimated to carry from 10 to 20 per cent. of metallic tin. Two men working the croppings of this vein and a third hauling with a wagon and team of three horses were able to mine, sack and haul to the beach one ton of ore a day.

Tin ore of the same general character as that at Cassiterite Creek has been found on Tin Creek, and prospectors report that the croppings of the lodes have been located, though nothing more than assessment work has been done, and this merely to hold the ground. The locality was not examined by the writer.

Cape Mountain is situated in the extreme western end of the peninsula and takes its name from Cape Prince of Wales. It is essentially a granite boss surrounded by limestones and slates, in which it is intruded. Float ore, consisting of cassiterite in association with tourmaline and other minerals, has been found at many places on the mountain, and systematic prospecting for tin bearing ledges has been in progress for the past three seasons, but the development has been slower than at Lost River, mainly on account of a heavy mantle of talus and residuary soil, which makes it difficult to trace the float ore to its bed rock source. In many prospect holes this covering goes to a depth of 6 or 7 feet. During the summer of 1904 work was done at a number of places. most extensive workings were those of the Bartels Company. This company in 1902 and 1903 staked many claims around the mountain and began development work in 1903. The equipment of the company consists of a permanent camp (called Tin City) and central power station, from which wires run to electric drills at the prospecting tunnels. The bed rock in many of the prospect holes carries traces of tin, but ore of appreciable value has been found in place in only one of the tunnels. This tunnel, which is on the mountain 1/2 mile north of Tin City, is in the granite near its contact with the limestone. Assays of picked samples from this tunnel have yielded as high as 40 per cent. of tin, but no average samples had been taken or assayed at the time of the writer's visit, and the average rock from the dump will probably show only traces of tin. The prospecting on this mountain has unfortunately been done mostly on the surface and at many scattered places, usually as assessment work, merely to hold the various claims; consequently the development of possible veins, or lodes, has not been commensurate with the work done. In only one case has ore containing more than traces of tin actually been found in the bed rock, and further work will be required to demonstrate whether or not ore bodies of commercial value exist.

Considerable prospecting for tin was done on the surface of Brooks Mountain, which is located about 5 miles north of the Lost River locality, and lode deposits similar to those at Lost River are reported to have been found. Ears Mountain is located about 60 miles northeast of Cape Prince of Wales and 50 miles north of Port Clarence. Several parties of prospectors searching for tin ores have visited this locality during the last two years, and many specimens of rock supposed to be tin ore have been brought out. With one exception, none of these which were examined contained more than traces of the metal.

Outside of the occurrences noted above, tin ore is not known to have been found in place anywhere in Alaska. These localities are all in the York region of Seward Peninsula. While Mr. Collier was at Nome in the early part of the past season, however, a specimen of tin ore said to have been found in the region north of Cape Darby was referred to him by a prospector who had recently returned to Nome from Norton Bay. The specimen seemed to be a piece of granite that had enough cassiterite disseminated through it to make up possibly 10 per cent. of its weight. If this find turns out to be genuine it will indicate a wide distribution of tin bearing ledges beyond the limits of the York region.

Placer Tin Deposits.

Tin ore in the form of pebbles disseminated through the alluvium is more easily detected and more easily mined than the same ore confined in the bed rock, and in a region overrun by prospectors searching for placer gold, as is Seward Peninsula, the distribution of the stream tin will be determined long before its sources in the bed rock have been found. Small specimens of stream tin have been found in the northern part of Seward Peninsula, from Cape Prince of Wales to the south shore of Kotzebue Sound, and in the southern part of the peninsula the ore has been found in several streams of the Nome district. The tin bearing gravels are shallow and of low grade, and in a region of high wages and short working seasons only the most promising deposits of this kind can possibly be worked at a profit.

During the past season placer mining for tin was in progress in the York region on Buck Creek, and good prospects are reported to have been found on York River. Specimens of tin ore were discovered in the gravels of one of the streams of the Fairbanks district in the interior of Alaska.

Buck Creek, which is situated about 20 miles north of York, has been the center for placer tin mining operations since 1901. During the season of 1904 these operations were resumed on a somewhat larger scale and the ground was handled with horses and scrapers. Iron riffles of the Hungarian type were used in the sluice boxes and about 20 ounces of gold were separated by panning the concentrate from the first three or four bars. An unsuccessful attempt was made to haul tin ore from Buck Creek to York with a traction engine. This machine moved itself several miles up the Anikovik River, on the road from York to Buck Creek, but was unable to cross the tundra. It is reported that about 60 tons of 40 to 50 per cent. ore were obtained on Buck Creek and hauled with horses to York. In the latter part of August there was a pile of about 23 tons of tin ore at York awaiting shipment.

Considerable prospecting we done early in the season on York River, a western branch of the Pinguk, which flows northward from Brooks Mountain. Stream tin is reported to have been found in the gravels for more than 10 miles along this river. In the samples the cassiterite is in fine grains, associated with small amounts of magnetite, garnet, tourmaline and quartz. The stream is said to be as promising as Buck Creek, but it is somewhat more difficult of access from the coast.

Small specimens of tin ore, consisting usually of only a few pieces, have probably been found during the season on several of the streams where mining was in progress near Nome. One such specimen reported came from the gold placers on the divide between Dry and Dexter creeks, and a considerable amount of such ore was found on Gold Bottom Creek.

Small amounts of stream tin were also found during the season in the placers of Cleary Creek, in the Fairbanks district, on the lower Tanana. A specimen of this kind obtained by Frank L. Hess of the United States Geological Survey consists of several rounded pieces of cassiterite resembling that of the York region. This discovery seems to be of scientific rather than economic importance, since, as in the Dawson region, the mineral is found only in small quantities.

W. L. C.

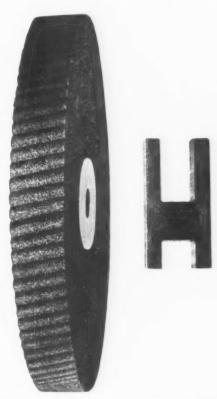
Congress has given permission for telephone and other electric companies of Washington to construct conduits, and the District commissioners have ordered all wires to be placed underground. Work is to be started at once, with the expectation that it will be completed in about five years. The telegraph companies have been given the

privilege of occupying a part of the telephone conduits, a privilege which is to be accepted by the Postal Telegraph Company, while the Western Union Company is to build its own conduits.

The Corrugated Grinding Wheel.

To greatly increase the rate at which the grinding of metal may be accomplished a new grinding wheel having inclined corrugations, or rounded teeth, on the periphery has been brought out by the Corrugated Grinding Wheel Company, 5036 Hazel avenue, Philadelphia, Pa. In grinding the corrugations afford "relief," and being inclined a shearing action is combined with that of grinding. The corrugations are formed on the wheel by a patented tool, which may be used without any special fixture, requires no unusual skill and does not necessitate removing of the wheel, being handled very much as though it were an ordinary emery wheel dresser.

The effect of the corrugating is claimed to be very marked. Numerous tests have been made with a great



The Corrugated Grinding Wheel and a Piece of Work Showing Its Grinding Ability as Compared with a Plain Wheel.

variety of wheels before and after being corrugated. These have been used to grind many different materials under various conditions, and the results have shown that the corrugated wheel grinds more rapidly, with much less heating and with a greatly reduced tendency to glaze. It was also found that wheels harder than would otherwise be possible are made entirely practicable when corrugated. This increased hardness compensates for the more rapid wear which would otherwise take place, and at the same time makes the wheel stronger and safer. Beside the illustration of the wheel is shown a piece of gray iron plate 34 inch thick which was used in a comparative test of a corrugated and a plain wheel. It was first ground on one edge with the plain wheel, the grinding continuing for 30 minutes, and the pressure of the work against the wheel being kept uniform by a suspended weight arranged to hold the work in contact with the wheel. The wheel was then corrugated with the tool and the plate was reversed and ground on the opposite edge under the same conditions of pressure and for the same length of time, 30 minutes. The end ground with the plain wheel was cut to a depth of 11/4 inches, while the opposite end ground with the corrugated wheel was cut to a depth of 3 inches, or a gain in rapidity of grinding of 140 per cent.

Notes from Great Britain.

Rumored Armstrong and Westinghouse Consolidation,

London, March 25, 1905.—Although the officials both of the British Westinghouse Electric Company and the Armstrong-Whitworth Company deny all knowledge of it, yet a statement is authoritatively made that an agreement has been reached whereby the Armstrong-Whitworth Company absorbs the British Westinghouse Company. The securities of the British Westinghouse Company are of the normal value of £5, but they have passed temporarily out of the dividend list and have been quoted as low as 2½. They have now rallied to 3¼, and this improvement is attributed to the rumored amalgamation. There may, of course, be no truth in the rumor, but I heard incidentally the other day that prominent officials of both concerns had been spending an agreeable holiday in Paris.

If true, there can be no doubt that the probable combine will be one of great strength and will undoubtedly rank as one of the most important mergers in modern history. It is relatively not difficult to form a consolidation in industries confined to the earlier processes, but where a product is complex and highly finished the combine is exceedingly difficult successfully to compass.

The Armstrong-Whitworth amalgamation, which took place in 1897, attracted considerable attention, and in their first report the directors of the united businesses expressed a firm confidence that the step that had been taken would prove of lasting benefit to both companies. It is not too much to say that this confidence has been fully justified, although, of course, there have been trade fluctuations which, on occasion, have proved somewhat disappointing. The British Westinghouse made its appearance in this country in 1899 with the object of establishing works for the production of every description of electrical machinery and appliances on a larger scale than any then existing in Great Britain, and thus meeting a demand that had hitherto been largely supplied from foreign sources. The wide range of interests that engage the attention of Armstrong-Whitworth was well illustrated by the announcement in the last report, in which it was stated that in view of their long connection with the Italian Government, and in order to strengthen the position of the company at Pozzuoli and in other quarters, the directors had acquired an interest in the firm of Ansaldo & Co. of Genoa. Another point that is well worth bearing in mind at the present juncture is that the company feels sufficiently sure of its ground to increase the rate of the interim dividend on its ordinary capital. The matter is best explained by one or two quotations from the last annual statement, issued in September:

"It is proposed to declare on the ordinary shares a dividend of 3 shillings per share, of which 6 pence per share has been already paid as interim dividend. . . . The directors have for some time past been approached by shareholders as to the possibility of increasing the interim dividend so that the two divisions of the annual dividend may be more nearly equal than at present. Any arrangement of this kind must, of course, be dependent on future circumstances, but it is proposed to increase the interim dividend payable in April, 1905."

This implied purpose has been fulfilled by a declaration of a distribution of 5 per cent. (actual) as compared with 2½ per cent., and while we must wait to see how the results for the full 12 months turn out, the alteration in the financial policy may be accepted as an indication that during the current period orders have been at least moderately plentiful and the margin of profit not unsatisfactory. The fortunes of the concern since the fusion with Whitworths nine years or so ago are shown in the following table:

	dividend per share.	Balance
Year to end of June. Net profits.	s. d.	forward.
1896£356.404	2 3	25,709
1897 441,163	2 8	3,478
1898	3 0	2,625
1899	4 ()	680
1900	4 ()	6.252

1901.					۰				506,483	2	6	96.091
									493,252	3	0	92.440
1903.							,		486,021	3	0	81.576
1904.									501.887	3	0	86.389

A glance at the last balance sheet is sufficient to show the strong financial basis on which the great undertaking rests. The ordinary share capital amounts to £3,210,000 and the issued preference shares to £384,850. In addition to these securities there are debentures to the tune of £1,500,000. The reserve fund stands at around £600,000, and certain provision has also been made for expenditure on experimental account and for renewal of plant. It may be admitted that the last mentioned item has been heavily drawn upon of late, but there is no reason to doubt that the shareholders have had good value for their money, and the trade revival which now appears to be in progress may easily raise the level of profits to the high water mark of 1900.

The progress of the British Westinghouse Company has not been so satisfactory as could have been hoped, though, in the very nature of things, it could not expect to leap into immediate prosperity. Credit must be given George Westinghouse and his American friends, not only for the energy which they have thrown into the organization of the young undertaking located in Trafford Park. Manchester, but also for the thoroughness with which they have backed up the venture as regards capital. This matter was alluded to at the last meeting of the shareholders by the deputy chairman in the following terms:

"I am certain I need hardly assure you that in so far as your co-proprietors on the other side of the water are concerned they feel more deeply than I can tell you the strongest possible interest in your company and a certain confidence in its ultimate success. They have spared, and are sparing, no efforts that will assist toward bringing about this result, and may I not say . . . that the best evidence concerning the confidence felt by them for the future that I can adduce appears to me to be expressed in their action during the past year, in which, without asking one penny from British shareholders, your American associates have invested 900,000 more sovereigns in your business? Men who back their judgment and belief with their money in so striking a manner are unquestionably entitled to the confidence and encouragement of others who are interested with them.'

Taking the British Westinghouse figures, we find that the record, starting with the beginning, has been as under:

Year ended	Paid up		Ordinary	Orders
July 31.	capital.	Net profit.	dividend.	received.
1900	. £950,000	£22,551	NII.	£547,000
1901	.1,132.288	49,533	Nil.	738,000
1902	.2,250,000	60,686	Nil.	932,000
1903	.3,064,418	107,609	Nil.	1,657,114
1904	. 3.866.353	50.678	NH	927.336

Machinery Requirements in South Africa.

Information accumulates on all hands that the "long lane" of depression in South Africa has at length turned. Undoubtedly improvement has set in, particu-The following facts are all espelarly in gold mines. cially interesting at the present moment: Nearly every mineral is found and worked in various districts, but the principal are gold, coal, copper and tin. Diamond mining has of course always been a very valuable industry, and particularly during the past year, when some extraordinarily rich finds have been reported. gold output for 1904 amounted to £17,025,355, that of coal £883,891, diamonds £1,185,083. The quantity of explosives manufactured in South Africa represented 5208 tons, that imported 1514 tons, making in all 6722 tons. The amount spent by the mines on stores and machinery was £9,000,000. The output of one diamond mine-viz., the appropriately named "Premier"—was 749,6531/2 carats, which produced a net gain of £607,738.

Tube Mills.—Among the recent practical and valuable innovations in the Transvaal gold mining industry perhaps the most important at the moment is the introduction of tube mills to permit of the ore being more finely crushed. So far as the working tests have gone these mills have proved not only a great improvement but also a distinct success. The great aim of these mills is to increase the extraction of gold by fully 5 per cent., or, on

the average, about 2 shillings per ton of ore. It has been shown that by their installation the crushing power can be augmented at less capital expenditure than would be necessary for the purchase and erection of extra stamps. Tube mills have of course been in use in Westralian mines for a number of years, so that their introduction places them on a sound footing from the practical point of view of South African engineers. Already the Modderfontein mine has secured three, while the several mines known as the "Eckstein Group" take between them a further 32. Should these particular items of machinery prove to be as satisfactory as is confidently anticipated for them there will undoubtedly spring up a very active demand, which should provide great scope for inventive ingenuity and result in important and ever increasing additions to the total of our machinery output.

Electrical Machinery.-One of the outstanding features of modern gold mining methods, also of coal, tin, &c., in South Africa has been the remarkable increase in the demand for electrically driven machinery for all purposes. Hauling, lifting, pumping and lighting are fast being accomplished by the use of electricity, each of which, it can be readily seen, requires an enormous expenditure to adequately provide the necessary plant. For lifting purposes a motor of the three-phase induction type, working at a pressure of 500 volts, is a representative one, and is capable of driving 125 horse-power. Where the depth is moderate 50 horse-power motors are frequently employed. There is just now quite a craze among South African mining engineers for the newest and best electric plants for hauling and lifting purposes. Pumping is gradually being performed by means of electric power, the well-known centrifugal pumps being largely used. These are also driven by steam power, oil motors and turbines, and are a vital necessity to many mines. For lighting purposes a vast and ever increasing supply of plant and fittings is required, forming in itself no inconsiderable portion of the expenditure ac-

Diamond Drilling .- This important branch of mining is responsible for a very large demand for all kinds of drills, as the work is of a general nature—that is to say, it is not confined to the industry implied in the name. As a rule, this work is done nowadays by electricity, on account of the handiness and convenience of the system. the motor being placed wherever desired, as against the inconvenience and loss of power occasioned by old time methods. Boring drills are an absolute necessity in every class and description of mines and afford a great and remunerative field for the engineering section chiefly devoted to their production. In addition to power driven drills a large quantity of small hand power machines is in constant use, owing to the fact that it frequently is an impossibility to place in position one of the larger kind driven by other than hand power. There are a good many different types required, according to the geological formation and conditions of working, and manufacturers. in order to participate in this trade, should be practically conversant with the conditions governing each particular locality of the great mining area.

Gas Driven Machinery.—Although from the foregoing it will be seen that electricity has the principal share of the burden to bear in connection with the mines in South Africa, it must not be assumed that the older and still very reliable and, on the whole, satisfactory gas engine is played out. On the contrary, quite a number of mine engineers and managers favor the use—partial, at any rate—of such, and only quite recently one of the leading mines on the Rand ordered a complete gas producing plant for early shipment. The principal drawback is, of course, the necessary supply of raw material to produce the gas, which in certain districts is somewhat scarce.

A few years ago an inventor brought out a compact little plant destined for the production of cheap gas for mining and similar purposes located far from municipal supplies. The invention consisted of a well devised copper generator, wherein sulphuric acid and iron were combined, producing a gas far superior for power purposes to the ordinary town supply. By carburetting the same was, of course, available for lighting also. The

great drawback was that the residue had to be disposed of in order to reduce the cost, and this occasioned too much trouble to the user. The by-product (sulphate of iron) was a remarkably pure one, but the disadvantage referred to put it out of the realm of practical use.

S. G. H.

The American Belgian Chamber of Commerce.

Dr. Alexander Van Schelle, who was Belgian Commissioner to the St. Louis Exposition, has remained in this country since the close of the Fair with the view to exerting what influence he could toward securing better commercial relations between Belgium and the United States. One result of his efforts was the formation last week in Chicago of the American Belgian Chamber of Commerce, an organization whose object is "the promotion of measures calculated to favor and develop the relations reciprocally between the United States and Belgium in literature, science, art, commerce, industry and finance." The following prominent Western men are interested in this organization: Enos M. Barton, president Western Electric Company, Chicago; Frank E. Tracy, vice-president First National Bank, Springfield, Ill.; James A. Easley, Springfield, Ill.; E. P. Russell, Russell-Brewster & Co., Chicago; W. R. Goodwin, Breeders Gazette, Chicago; A. Van Schelle; Chas. Henrotin, Belgian and Turkish Consul General; G. A. Spoor, president Union Stock Yards, Chicago; W. E. Skinner, general manager Union Stock Yards, Chicago; John S. Cooper, Julian Hillard, F. J. V. Skiff, G. E. Otis, Maurice Pincoff, Col. Chas. Mills, all of Chicago, and M. De Ridder, Belgian Consul, Louisville, Ky.

Temporary offices have been opened at 159 La Salle street, Chicago, and efforts will be made to make it useful from the start. Among other things, it proposes to establish a court of arbitration for adjusting agreements between American and Belgian firms, to further the participation of American exhibitors in Belgian expositions and vice versa, and to interest capital in America in the exploitation of commercial and industrial enterprises in both Belgium and the Congo Free State, which latter country is largely owned by King Leopold.

One of the great lines of activity of the American Belgian Chamber of Commerce will be an effort to introduce into America the adoption of methods and machinery such as are now used in Belgium and other European countries for the profitable extraction of by-products resulting in the manufacture of beet sugar and obtainable from cereals and other American products. House Bill No. 9302, introduced by Congressman Boutell of Chicago into Congress, calling for the abolition of internal revenue and other Government charges from denatured or undrinkable alcohol will have the active consideration of this body. Dr. Van Schelle has delivered lectures throughout the country before educational and industrial bodies, calling attention to the great economic gain which follows the use of denatured alcohol for industrial purposes, the claim being made that for automobiles, gasoline engines, modified gas engines and other similar power devices alcohol can be used either for fuel or for internal combustion at less expense per horse power than attends gasoline, and that the only obstacle in the way for its substitution for gasoline and naphtha is the high internal revenue tax levied by the Government on alcohol of all kinds.

The American Smelting Exploration Company has been organized under a New Jersey charter, with a capital of \$54,500,000, of which \$49,000,000 is issued capital. The new company will take over the properties of the Guggenheim Exploration Company, and will be controlled by the American Smelting & Refining Company. It is officially stated that the company will enter into the smelting and refining business on a large scale before the year is out. According to a statement made to The Iron Age by an official of the company, its organization has no relation whatever to the negotiations for the merger of the lead properties which the Guggenheim interests are trying to add to their heldings.

The International Sprinkler Company.

Some years since the late Clark Merchant of Merchant & Co., Incorporated, Philadelphia, became interested in the development of a sprinkler company which had been in existence for some time but had not gained wide recognition. Powell Evans, who had had a varied experience in underwriting business enterprises of magnitude, assumed the management, and in a brief period of improvements in the devices controlled by the old company and by the introduction of new inventions rounded out the system, obtaining for it the official indorsement of the underwriters' boards and installing the system in a large number of well-known plants.

Mr. Evans, who upon Mr. Merchant's death became the president of Merchant & Co., Incorporated, and the president of the International Sprinkler Company, has recently organized an English company, the International and the second set "wet"—i. e., with water throughout the system. Important considerations in the dry valve are simplicity and the certainty to operate. In designing this dry valve the inventor departed from existing types, and has produced a valve with an entirely new principle.

The valve consists of a main body, divided into an upper or "air chamber," closed by a vertical swinging check; an intermediate chamber, under atmospheric pressure when the valve is "set," and a third, or "water intake" chamber, normally closed by a swinging check. This check also serves a second function by closing the atmospheric opening through the intermediate chamber by its reverse side when the valve opens and water is admitted to the sprinkler system. The hinge of this water check is of peculiar form, having a long slotted protruding stem which engages an adjusting screw, A, and swings on a fork centrally attached to this stem. The outside end of this stem, as already stated, is engaged by

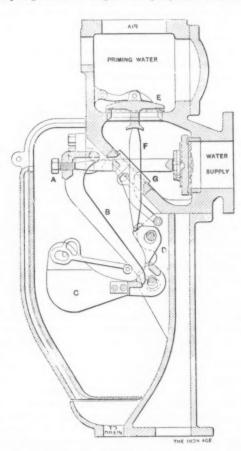


Fig. 1.—The Evans Dry Pipe Valve Set with Air on the System.

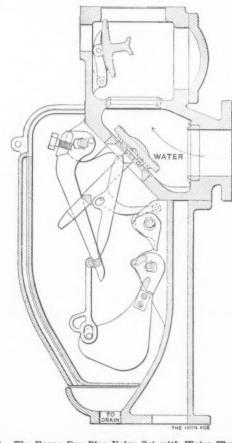


Fig. 2.—The Evans Dry Pipe Valve Set with Water Throughout the System.

Sprinkler Company, Limited, of London, England, which will undertake the introduction of the system in all parts of the world.

The Evans Dry Pipe Valve and Alarm Valve.

The sprinkler system for fire protection as installed by the International Sprinkler Company, Philadelphia, Pa., has three essential parts, the automatic sprinkler head, dry pipe valve and the alarm valve. These devices are of designs patented by the president of the company, Powell Evans. The first of these, the sprinkler head, is generally familiar to the trade, its latest form having been brought out in 1902. The dry pipe valve and alarm valve are mechanisms of a more complicated nature, and in a way are the most important parts of the system. If one sprinkler head fails in time of fire it may cause little extra loss, providing others in its vicinity operate, but if the dry pipe valve should fail-controlling as it does anywhere from 200 to 500 sprinkler heads-the entire system would be useless, and if the alarm valve should fail the results might be equally serious from a failure to discover the fire promptly.

Figs. 1 and 2 show sections of the Evans dry pipe valve, the first set "dry"—i. e., with air on the system—

a set screw, A, which is adjusted through the upper end of hook B, loosely swinging on knife edged ears. The lower end of this hook is caught on a weight, C, swinging loosely on a pin. This weight, in turn, engages with a tumbler, D, loosely swinging on a knife edged pin. The tumber is held by the air clapper E by means of a vertical strut, F, passing loosely through the slot in the fork G, the movement of this strut being limited by a loose pin connecting it with the fork. The entire mechanism, therefore, practically consists of three loosely swinging levers connecting a standard air check with a standard water check. All the working mechanism lies entirely out of the waterways. The area of contact between the working parts does not exceed a square inch. All these contacts separate with an angular movement, hence no corrosive action could prevent the valve from opening properly. The air and water valves are of equal area, and make metal to metal contacts.

No third valve is required to trip the dry valve, as the main air check is itself the tripping device. The valve opens by the combined action of the water pressure and the use of a weight, the weight, regardless of water pressure, causing opening when the air pressure is, reduced to 9 pounds per square inch. This weight would, therefore, lift a column of water in the air system more than 20 feet in hight should it accidentally be present. In actual practice a water column of this hight or greater rarely, if ever, occurs; hence the valve is incapable of being "water columned." The influence of water pressure on this device is limited, by the leverages employed, to 6 pounds per square inch against the air clapper. Therefore, when adjusting screw A is set tight enough to hold any available water pressure, the valve still opens at not more than 16 pounds of air pressure.

Among the advantages of the Evans valve is that with a comparatively low pressure, not more than 30 pounds in practice, which permits a reasonable leakage without producing danger of the valve tripping, the device also holds any available water pressure. Under any condition of water pressure, such as a very low, very high or very irregular one, the valve opens promptly should accident or fire cause one or more sprinkler heads above it to operate, thereby sending the water to the point of danger with minimum delay.

The Evans alarm valve is shown in Fig. 3. In its most complete form it consists of four different parts,

shoulder, avoiding a place for the accumulation of dirt. This insures the valve remaining tight even with very dirty water. Where variable pressure exists in the water supply the retarding chamber is inserted between the alarm check and the gongs. This chamber produces a delay of 10 seconds in the ringing of the gong and prevents the latter from sounding as the result of water hammer. As water hammer has never been observed to last continuously for more than 5 seconds, and as the retarding chamber will only operate the gongs when there is a continuous flow of water through the main check valve for 10 seconds, no alarm will be sounded except as the result of an accident or the existence of a conflagration.

The operation of the chamber is simple. The upper part is an air chamber, the next part below a main drip chamber, the third part a chamber leading to the alarm and the fourth the lowest part or main water supply for the alarms. The upper or air chamber is connected to the by-pass leading from the main alarm check. The lowest or main supply chamber is connected with the main water supply under the alarm check clapper. Water passes into the air chamber through a strainer, and thence

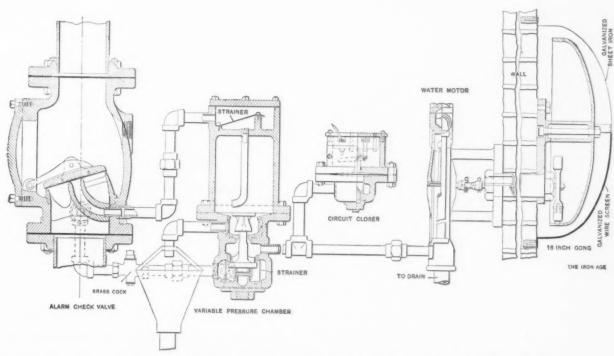


Fig. 3.—The Evans Alarm Valve and Mechanism for Sounding the Alarm.

the alarm check valve, the retarding of variable pressure chamber, which operates to prevent a false alarm when water hammer conditions are present; the electric circuit closer, which is connected with an electric bell, and the water motor, which carries with it a 16-inch steel gong. The check valve is placed in the main riser and is designed for either vertical or horizontal use, as circumstances may require. It is practically a standard angle check containing a small central by-pass to the The novel and most important feature of the device is the method whereby this central by-pass is closed. This is accomplished by inserting a bronze diaphragm in the center and on the under side of the main valve clapper. Perforations through the outside edge of this diaphragm admit water pressure above it. When the clapper comes down upon the main seat the diaphragm at the same time closes over the by-pass opening and the water pressure above moves the diaphragm sufficiently to tightly bottle up this by-pass to the alarm system. The movement of the diaphragm is so slight, however, that the passage of sufficient water through the main riser to operate only one sprinkler will raise the clapper and admit water through the by-pass to the alarm system.

Both the main seat and the diaphragm seat of the alarm valve are bronze and are brought up to a narrow

through a 1/8-inch orifice, and passes out again through a 1/8-inch orifice in the diaphragm constituting the bottom of this chamber, thence to the main drip. The area of this diaphragm is 20 square inches.

A valve stem passes from the bottom valve in the bottom chamber through an intermediate orifice to the top valve resting against the under side of the diaphragm. A spring, as well as water pressure, normally keeps the bottom supply valve closed, as shown in the figure, and when the bottom valve is closed the top valve is "up," so that the two intermediate chambers are both connected with the main drip. The bottom valve is 2 inches in diameter, or about one-sixth of the area of the diaphragm. As one-half of the diaphragm has movement, when onethird of the pressure has been pumped up into the air chamber that exists in the main system, the opposing forces in the air chamber and in the supply balance each other. Therefore, when slightly more than one-third of the pressure is pumped up the diaphragm is forced down, carrying with it the valve stem, and thereupon the entrance of the third chamber to the drain is closed and the main supply valve in the lowest chamber is opened, thus admitting water direct from the main system to the alarm gongs. It is, therefore, seen that the retarding chamber really balances the same pressures. Hence, regardless of the pressure in the main system, a fixed interval of time is required to get water to the alarms. A strainer is provided in the fourth or main supply chamber, and all parts of the device can readily be opened for inspection and may easily be taken out and cleaned.

The circuit closer contains a bronze diaphragm which operates a standard electric switch made in a careful and simple manner. The inspection plate on the side of this device affords access to the switch for testing or inspecting.

The water motor is a powerful device, all the parts of which in contact are made of bronze and are small in area. This motor should be kept free from grease of any sort, as it is intended to be used in exposed positions and to stand idle for long periods, but must still be capable of working with certainty on occasion. As grease cakes and sticks in time, its use on moving parts is never recommended.

In connection with dry pipe systems for mutual work, where the system is kept with air on throughout the year, either the circuit closer or the water motor, or both, are connected direct to the intermediate chamber of the air valve; but in stock work, where water is left in the system during the summer and an alarm is required, the alarm check is connected to the dry pipe valve at the intake end. If variable pressure water supply exists the retarding chamber is also used. It is optional with a customer—unless insurance rules specify otherwise—to have either an electrical alarm or mechanical alarm, or both. It is always advisable to have both, as the certainty of the alarm is increased, and, further, the location of the alarms may be varied so that the gong is sounded at different points.

Canadian Niagara Power Interests.

The nineteenth annual report of the Commissioners of Victoria Park, on the Canadian side at Niagara, which was submitted to the provincial legislature March 31, is an interesting contribution to the literature treating of the Niagara power development, as it contains a valuable and luminous exposition of the progress and present status of the work of the electrical development at Niagara.

The opening portion of the report is a résumé of the work done in the development of the park since the appointment of the first commission in 1887, the park having been opened free on May 24, 1888. Originally the area was 196 acres, which has since been increased to 787 acres. The total amount spent in acquiring and maintaining this property up to December 31, 1904, has been \$1,351,139, while the total receipts for the same period have been \$1,328,679, the excess of expenditures over receipts during this time having been \$22,460.

But the most interesting feature of the report is the wonderful manner in which the resources of the park have been built up by the assessments made for power franchises and rights. It is shown that the Niagara Falls Park & River Railway, the scenic line along the cliff and through the park proper on the Canadian side, has paid the commissioners \$132,500. The Canadian Niagara Power Company, which was first to secure rights in the park, has paid a total of \$224,577.78. The Ontario Power Company has paid \$110,000 and the Electrical Development Company of Ontario, Limited, has paid \$30,000, while the photographic and other concessions have paid \$103,700. This makes a total of \$620,-777.78. The three power companies have paid a total of \$364,577.78, and the only power yet developed is that in the station of the Canadian Niagara Power Company, where 30,000 electrical horse-power is available. Ontario Power Company, which has paid \$110,000, will have power generated during the coming summer, while the Electrical Development Company will hardly have power this year, but has paid \$30,000. Each of the companies will add to the amounts mentioned this year by its semiannual payments. It is further stated in the report that the annual revenue now assured to the park is \$84,200. This revenue, it is stated, will increase from year to year, with the growing demand for electrical energy, and in all probability will amount within the next five years to over \$200,000 per annum. On the important question of the further development of Niagara power the commissioners go on record in the following statement:

"Seeing that three franchises have already been granted for the withdrawal of water from the Niagara River for the development of approximately 375,000 electrical horse-power, and a further franchise for 100,000 horse-power to be drawn from the Chippawa River, making an aggregate development already authorized of possibly 475,000 horse-power, it rests with the Government to decide whether as a matter of public policy any further concessions shall be granted at the present time. The points to be considered are:

(a) The franchises already granted to three separate corporations for such a large aggregate development should for the present be sufficient to induce effective competition in the supply of electrical energy, and until the extent of the demand there will be for its use in Ontario is definitely known.

(b) If such demand in the near future appears to require further development, additional concessions can be granted in good time to meet it.

(c) If the methods adopted by the various power companies for disposing of electrical power at Niagara and throughout the province by transmission are satisfactory both in respect to efficiency of service and price, the Government will then be in a position to decide whether the public interests will be better served by granting further corporate franchises or in otherwise

dealing with the development and sale.

(d) If a greatly increased demand arises in the future for electrical power, doubtless the value of franchises for the use of Niagara River water will be largely increased and better terms will be secured for any additional concessions that may be here-

after granted.

(e) If franchises are granted, which are likely to be, on the American side of the river, involving the withdrawal of a large volume of water from the river, thus seriously affecting the existing levels, it may become necessary in the protection of Ontario interests to have equal or greater withdrawals of water on the Canadian side of the river, or that an international agreement should be arrived at for a defined limitation of such withdrawals.

"It should also be borne in mind that the granting of new power franchises in the park or the enlargement of the existing licenses, as now asked for by the Electrical Development Company, will necessitate the construction of buildings on the shore of the river, which constructions may cause an undue defacement of the park and water views, which, if possible, should be avoided."

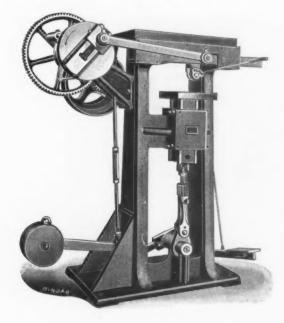
Hydro-Electric Power at Greenfield, Mass.

The town of Greenfield, Mass., important as the center of the tap and die industry of the country, promises to become practically independent of steam as a source of The Greenfield Electric Light & Power Company has put into operation 1200 horse-power developed from a reservoir recently completed a few miles from the town. The company furnishes the town with its electric lighting and is now in a position to furnish power for manufacturing. It has adopted a policy, which may very well be followed in other places, of making a low rate for small users of power. Instead of the usual wide difference in price per horse-power according to the amount purchased by the consumer, a uniform rate of \$40 per horse-power per annum has been set, so that even the small industry which requires only one or two horsepower can get it at this price, which is very low as compared to the usual price in other similarly situated New England cities and towns. No small consumer can develop power by his own engine at anywhere near such a figure; probably the cost would be twice that amount.

Already a number of the prominent manufacturers of Greenfield have installed motors to be operated by this power, including the Wells Brothers Company, F. E. Wells & Son Company, the E. F. Reece Company and the Automatic Machine Company. As the total steam power used in Greenfield is only between 500 and 600 horse-power, it will be seen that the Electric Light & Power Company has ample power at its new dam. It is believed that the presence of this cheap power will have a tendency to attract new industries to the town, and this is one of the reasons for establishing the uniform rate.

The Slate Metal Marking Machine.

A foot or hand power machine for marking metals has its limitations when the work is continuous and a great many pieces are to be marked. The labor involved is tiring and one man cannot perform the several operations required and at the same time have his hands free to remove and insert the work. To do the work by power, the Dwight Slate Machine Company, Hartford, Conn., has brought out a machine which acts on a principle somewhat analogous to that of a power hammer. In this machine no great power is required for the marking, as a cylindrical die is used for marking flat surfaces and a flat die for marking cylindrical surface. Thus the die is brought into contact with the work a little at a time. This not only saves power as compared with a punch but also increases the life of the dies, besides giving an accurate, even marking. Another advantage is that cer-



A Power Press for Metal Marking, Made by the Dwight Slate Machine Company, Hartford, Conn.

tain materials which would be distorted by a punch can be marked without distortion by this process.

In marking flat work the piece is held by a fixture on the table and the cylindrical die is held in a yoke or holder on the arm connected with and operated by a crank disk on the main shaft. The throw of the crank is adjustable, so that the die may be given a travel across the work equal to the length of the characters to be marked. The power which does the marking is not transmitted through the die, but through the table. The hight of the table is adjustable through a turn buckle on the vertical rod. The table is adjusted until the work almost touches the die. The operator then presses the foot treadle which operates a powerful square jawed clutch on the main shaft, causing the disk to revolve, and at the same time releasing the weighted lever at the base of the machine. The lever through a powerful toggle joint provides the necessary pressure for the marking, the amount of this pressure being regulated by the position of the weight on the lever. This power would be insufficient were it not for the fact that contact between the die and the work is along a single line instead of over the entire surface of the die, as before explained.

The principle is similar where the work has a cylindrical surface, in which case a flat die is attached to the connecting arm, and the work is held in a fixture which permits it to revolve with the die when the latter is traveled over it. By maintaining the pressure upon the treadle the action is continuous, which is allowable where simple work is being done, giving the operator time to remove the completed pieces and replace them while the machine is working. When more complicated

pieces are to be marked the machine is stopped between operations by releasing the treadle. As will naturally be appreciated, the machine is adapted for a very wide range of work.

The machine is furnished with a three-step cone pulley, which, with a countershaft speed of 90 revolutions per minute, gives 8, 12 and 18 impressions per minute. The speed may be increased if the work is such as to permit of more rapid handling, the limit depending upon the time required for inserting and removing the pieces to be marked.

The Portsmouth Steel Works to be Modernized.-The Portsmouth Steel Company, Portsmouth, Ohio, owned by the Whitaker-Glessner interests of Wheeling, W. Va., is remodeling and modernizing its entire plant at Portsmouth. A new 30 x 84 inch plate mill will be installed. This mill is being constructed from entirely new designs by Mackintosh, Hemphill & Co., who are also building the 40 x 60 inch engine by which it will be driven. The mill will be served by the usual tilting and cooling tables. The other new installations will be principally in the line of accessories, such as boilers, feed pumps, shears, heating furnaces, cranes, electric generators, motors. &c. The old sheet mills and the old bar mills, with one exception, will be torn out. The present plate mill will be changed to take 28 x 60 inch rolls and will be used for rolling thin gauges. The 18-inch bar mill will be moved to a new location to make room for the large plate mill. The open hearth furnaces are being rebuilt, making them of full 35 tons capacity each. D. F. Nisbet, Lewis Building, Pittsburgh, is consulting engineer for the company and is in charge of the plans for the work.

Chateaugay Furnace Improvements.-The Chateaugay furnace of the Delaware & Hudson Company, located at Standish, N. Y., has been leased to the Northern Iron Company, Port Henry, N. Y. The Chateaugay furnace has been operated for some time by the Delaware & Hudson Company for the production of low phosphorus pig iron, and has been taken over by the Northern Iron Company preparatory to more extensive operations. The plant is to be materially enlarged. A new stack is to be built to the hight of 80 feet. A new modern Allis-Chalmers engine, now being built at Scranton, Pa., will be installed. A fourth stove is to be erected and other extensive alterations and improvements made which will increase the capacity of the plant to 200 tons daily. When completed the furnace will be blown in for the manufacture of low phosphorus pig iron, to be produced from the famous Chateaugay ore. This ore analyzes 65 per cent. in metallic iron and in phosphorus 0.006, producing an iron with phosphorus and sulphur about 0.020 per cent. The improvements to the furnace will cost in the neighborhood of \$100,000, and will require about five months for their completion, so that the furnace will be again blown in during the coming autumn. A new and modern plant is being installed at the Chateaugay mines to furnish an ample supply of ore for the furnace and for customers who are now using this ore for the production of low phosphorus pig iron in other districts.

After running a 12 horse-power gas engine at Wolverhampton, England, for upward of three days on a total consumption of 23,000 cubic feet of gas, at 50 cents per thousand, an electric motor especially designed for the work was substituted, and the cost of current for the same load and the same length of time was \$20. As the cost of gas figures out at \$11.50 it is seen that the saving effected by making use of the gas engine was \$8.50, or 42 per cent. The gas engine was one which had been in use for a period of about eight years.

On April 2 trains from the Swiss and Italian sides of the Simplon tunnel passed through the tube, meeting at the middle, where was an iron door which was open then for the first time.

An Automatic Electric Welding Machine.

BY EMILE GUARINI.

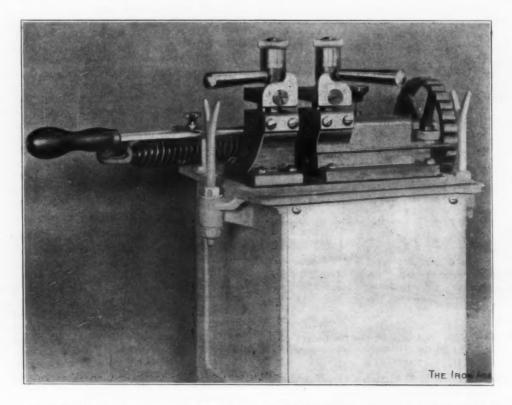
These machines, put on the market by the Electric Welding Company, Limited, London, are being largely used for welding wires in iron, steel, copper, brass and other metals, and also for making harness rings, buckles and similar articles. The welder, which is shown in the accompanying engraving, consists essentially of an alternating current transformer, having the ends of the secondary circuit attached to clamps between which the articles to be welded are placed. One clamp is stationary while the other is free to move in the direction of the fixed clamp under the influence of a strong spiral spring. The strength of the spring and consequently the amount of pressure may be varied and adjusted according to the size and nature of the material to be welded. An automatic switch is also provided on the machine, with

chine shown in the photograph is capable of welding iron and steel wires from No. 18 to No. 6 and copper wires from No. 18 to No. 11, and a special type of welder has just been designed for welding very small copper wires from No. 24 upward. Numerous other sizes of machines are also constructed for larger work. The maximum current required by a welder such as that shown is about 5 amperes at 300 volts.

Customs Cases.

Duty on Steel Shafting and Forgings.

Thomas Prosser & Son, New York agents for the Krupp steel works, have engaged in a controversy with the Board of United States General Appraisers, in which they allege that they have been unfairly treated, and which may lead to an investigation by the Secretary of the Treasury. The trouble arises over an importation



An Automatic Electric Welding Machine Made by the Electric Welding Company, Limited, London.

marked quadrant and set screw, to enable the exact length of upset on the weld to be predetermined.

In using the machine the pieces to be welded are clamped in the jaws, with their ends abutting, and a button is pressed on the top of the machine. The metal at the joint is almost instantly raised to a welding heat, the spring at once pushes the movable clamp closer to the fixed one, forming the weld, and when the movable clamp has traveled the allowed distance the automatic switch operates and cuts off the current. All these operations are automatically performed by the machine and are independent of the skill of the operator. Skilled labor is unnecessary, as any intelligent boy can with very little practice manipulate the machine and produce perfectly satisfactory welds.

Where a large amount of repetition work has to be done, as, for instance, in the manufacture of buckles, harness rings, wire hoops for wooden utensils, &c., the automatic principle is carried still further and the operator has only to insert the unwelded article and remove it when welded, the jaws being operated continuously by suitable mechanism driven by belt. A machine of this type will make from 6000 to 8000 welds per day.

By mounting the welding machine on a small truck and providing a welding circuit with plug connections at suitable points, one welder may be made to serve the requirements of a large workshop. The particular maof heavy steel shafting, connecting rods and other steel forgings, which was assessed for duty at 45 per cent. The importers protested, claiming the correct rate to be 35 per cent., and the case was assigned to Sub-Board No. 2 of the Board of General Appraisers, which, under Secretary Shaw's reorganization of the board two years ago, was given the adjudication of all cases involving the duties on metals. This Sub-Board consists of General Appraisers Fischer, Howell and De Vries. Testimony was taken on both sides, and about a month ago Mr. Fischer had prepared an opinion which, it is said, was favorable to the importers and in which the other members of his Sub-Board concurred. About this time an agitation arose concerning the issuance of conflicting decisions by the three sub-boards, and all the decisions were scrutinized more closely than usual. General Appraiser Lunt discovered that this decision conflicted with a former decision on the same subject by Mr. Fischer himself, and brought the matter to the attention of the General Board of nine. This body acted by taking the case from Mr. Fischer's Sub-Board and giving it to Sub-Board No. 1, consisting of Messrs, Lunt, Sharretts and McClelland, and the first intimation that Prosser & Sons' attorneys, who believed that the case was closed, had of the change was when they received a notice last week that Sub-Board No. 1 would take further testimony in the Prosser case on March 29. They appealed to the General Board for a

hearing, but this was refused them, and on March 29 they took part in the proceedings under protest. They declare that the Secretary of the Treasury alone has the power to designate the subjects to be considered by the three sub-boards, and that the General Board exceeded its authority in assuming to make such designations. They point out also that this was not a conflict in decisions by two sub-boards, but a reversal by Mr. Fischer himself of a former decision written by him. In other words, it was a case of a judge seeing new light, which frequently happens in all courts. The importers' attorneys will await the outcome of the case before deciding whether to carry it to the Secretary of the Treasury or to the higher courts.

Secrecy in Reappraisements.

The fight against secrecy in reappraisements, which was started last fall by George Borgfeldt & Co, has been taken up by the Merchants' Association of New York, which has announced its intention of trying to have the Treasury regulation which compels such secrecy abolished. The Borgfeldt case arose through the importation by this firm of a line of cheap china ware, which swept the domestic goods from the market. The domestic potters charged undervaluation, but two investigations abroad by two separate sets of special Treasury agents sustained the integrity of Borgfeldt & Co.'s invoices. Then a representative of the American Potters' Association went abroad and secured evidence which induced the Board of United States General Appraisers to advance Borgfeldt & Co.'s invoice values 10 per cent. Repeated efforts were made by the importers to secure permission to see this evidence and to confront the witness for the Gorvernment. Appeals were made to Secretary Shaw and to the President himself, but they refused to disturb the Treasury regulation which provides that all testimony given in reappraisement hearings shall be secret. Representatives of the Merchants' Association then went to Washington to lay the matter before the President again. They pointed out that a merchant under this system was at the mercy of a dishonest or unscrupulous competitor who might testify falsely against him with practically no fear of detection. Secretary Shaw made no argument for the present system, but filed with the President a letter on the subject. At the conclusion of the hearing the President announced that he would not interfere with the system of secrecy of reappraisements, but that he would permit the Borgfeldt case to be retried before a different set of general appraisers than those who heard it last fall. Whatever the outcome may be, the Merchants' Association will not abandon the fight that it has undertaken against the principle of secrecy in reappraisements, and it is likely that an early opportunity will be found to bring the matter into the courts.

British Standard Steel for Marine Boilers.

One of the most important findings yet issued by the Engineering Standards Committee is Report No. 14, containing a specification for structural steel for marine boilers. Hitherto there have been at least five more or less authoritative standards for the material in question, viz.: Those of the Admiralty, the Board of Trade, Lloyd's Register, the British Corporation for the Survey and Registry of Shipping and the Bureau Veritas. The specification adopted by the subcommittee on "Tests for Steel and Iron Material Used in the Construction of Ships and Their Machinery," and approved by the main committee, is less a specification for steel than for the tests to be applied thereto. The only stipulation as to the process of manufacture is that the steel shall be made by the acid or the basic open hearth method, "as may be specified and as approved by the inspecting body." committee has abstained from any attempt to define the most suitable chemical composition, this being a matter entirely within the province of the maker, who has to produce material capable of withstanding the required tests in a satisfactory manner. All tensile tests are to be performed upon specimens in accordance

with the standard fixed by Report No. 18, a copy of which is printed as the appendix to the present specification. The following is a brief summary of the tensile tests demanded:

Steel for Marine Boilers.

Elongation

(1	minimum)	
Tensile	in 8 in.	
strength.	length.	
Tons per	Per-	
Form. Purpose. sq. inch.	centage.*	Number of tests.
Plates. Shells and girders. 28-32	20	1 each plate rolled.
Plates.Flanging and weld-		
ing26-30	23	1 each plate rolled.
Bars. Stays, &c28-32	20	2 each charge of 15 bacs.
Bars. Stays in combus-		
tion chambers. 26-30	23	2 each charge of 15 bars.
BarsRivets26-30	25	2 each charge of 15 bars.

• For thicknesses of 0.375 and upward. For thicknesses under 0.375 inch elongation may be not more than 3 per cent. below the percentages stated in the table.

For cold bend and temper tests the specimens are not to be less than 11/2 inches wide, and in temper tests the samples are to be heated to a blood red and quenched at a temperature not exceeding 80 degrees F. In both cold and temper bends the test pieces shall be capable without fracture of being doubled over until the sides are parallel, and the internal radius is equal to 11/2 times the thickness of the specimen. The number of bend tests is fixed at one from each plate as rolled, and one from each angle or stay bar rolled. Bend tests are not required in the case of rivet bars, as the specification provides for the testing of finished rivets in the following manner: (a) The rivet shanks are to be bent cold and hammered until the two parts of the shank touch without fracture; (b) the rivet heads are to be flattened while hot until the diameter is 21/2 times that of the shank without cracking at the edges. The remaining clauses of the specification regulate procedure in respect of branding, certificates, facilities for inspection and other subsidiary but essential points.

An Open Hearth Furnace Record.—No. 7 basic open hearth furnace of the Lukens Iron & Steel Company of Coatesville, Pa., recently made a continuous run of 278 heats, weighing 12,994 gross tons, without any repairs whatever, and No. 8 furnace made a continuous run of 353 heats, weighing 16,590 tons, with no repairs excepting that a few bricks were put into the roof during stoppages of two or three days over Christmas. The weights given represent tons of bottom cast ingots, not the weights charged. The steel was all low carbon metal.

Tests of the strength of steel at high temperatures have been made in Germany by Professor Bach, who finds that up to a temperature of 300 degrees C. a gradual increase in tensile strength is apparent, amounting at that figure to about 12 per cent of the strength at the temperature of the air. Above this the strength fell quite rapidly until, when the highest experimental temperature, 550 degrees C., was reached, it was rather less than 50 per cent. of the original. The ultimate extension decreased from 25.5 per cent. at ordinary temperatures to 7.7 per cent. at 200 degrees C., after which it rose to a maximum of 39.5 per cent. at 550 degrees C. These results are important in connection with boiler design, for the steel in a modern boiler is frequently subjected to a temperature far above that at which it retains its full strength and ductility.

The average cost of generating current in 13 electric railway power stations in Indiana, which furnish some 85 per cent. of the output of the State, is \$0.00755 per kilowatt hour, measured at the switchboard. This amount is subdivided as follows: Fuel, 0.526 cent; labor, 0.158 cent; repairs, 0.039 cent, and lubricants, waste and miscellaneous supplies, 0.032 cent. The lowest total cost per kilowatt hour is figured out at 0.505 cent and the highest at 2.024 cents. This great relative range is largely due to the fuel charges, which vary from 0.368 cent to 1.405 cents, or 1 to 4.

A New Process for Refining Pig Iron.*-II.

BY J. B. NAU, NEW YORK.

Practical Application.

From the results obtained in England by Sir Lowthian Bell, and from those obtained on a large, practical scale in the Krupp process, still working in this country, and from Mr. Uehling's tests, it is apparent that the operation should be performed in a short time and at as low a temperature as will be consistent with an easy and complete success. The rapidity of the operation depends on the intimate contact between the liquid metal and the purifying ore.

All these conditions can be realized in practice in an apparatus of the kind shown in the accompanying engraving. The vessel, in the form of a cupola, may be erected in the immediate neighborhood of the blast furnace. It is provided with a basic, or neutral, lining on the bottom and over the whole hight of the purifying zone and with ordinary fire brick lining in the upper region. An inlet for liquid pig iron is shown in D; an outflow, A, near the bottom connects the cupola with a fore hearth, or riser, B, provided near the top with an overflow, C. A little higher up is located a slag hole, E. A circular bustle pipe above the inlet D supplies hot blast or air or heating gas through tuyeres, H. Near the bottom of the riser is an auxiliary tap hole, to empty the vessel toward the end of the operation. In F, a little above the purifying zone, the gases generated during the operation have a free outlet without passing through the ore in the upper part of the cupola. These gases, naturally of a reducing nature, are thereby effectively prevented from occasioning a possible premature reduction of the ores in the upper part of the cupola before they reach the refining zone. If necessary, provision may be made to admit air to the region above the reducing zone for the purpose of burning the gases produced in the refining zone and letting the products of combustion rise through the ore body, thereby heating this latter very economically. The outlet F remains and acts as a safety opening in case of a sudden development of a large volume of gas. At G, just below the hopper, is a smoke stack.

The operation is as follows: The cupola when empty is heated by means of blast furnace or other gases or hot blast, introduced through the riser B and the tuyere H. Draft is obtained through the suction created by the steam from the nozzle in the smoke stack or by means of an exhaust fan. After the cupola has been sufficiently heated it is filled to the top with pieces of rich ore of the size of a fist and larger, which are then heated by the same means to the desired temperature.

Liquid pig iron may now be run directly from the blast furnace through D. The iron striking the ore and percolating through it is partly refined while falling to the bottom of the cupola. Here its level is allowed to rise through the ore until, after sufficient purification. it reaches the hight of the outflow C, when it flows off. The slag formed during the operation rises on top of the metal and flows off through E. The ore is kept immersed in the bath by means of the pressure of the ore higher up, and as fast as it is consumed in the operation and is slagged off it is replaced by the ore immediately above, which is continuously pushed down under the weight of the fresh supplies charged through the hopper. The immersion of the ore in the bath is also very materially helped by the weight of the liquid pig entering the purifying apparatus and falling on the pieces of ore below, which has naturally a tendency to carry them down.

Since it is possible to heat to a temperature most favorable to the rapid refining it is presumed that sufficient purification can be obtained after five to eight minutes of contact. At any rate the length of this contact may easily be regulated by the change of the relative levels of the different openings so as to suit existing conditions in regard to the chemical composition of the iron and the ore. A little testing will easily establish the right conditions.

The presence of the riser affords the advantage that no piece of ore will interfere with the free outflow of the purified iron, because the ore, being much lighter than iron, will always have a tendency to rise in the bath and keep above the outlet A. At the same time the most refined metal, being the heaviest, will always be found near the bottom.

Since the apparatus makes it possible to keep the level of the ore always at the same hight, the amount of immersion and contact will remain the same throughout the operation, which naturally will induce uniform refining and this whether a large or a small quantity of iron be purified in one operation. This is important since it permits adapting the method equally well to a small or a large blast furnace. At the end of the operation the vessel is emptied through the auxiliary tap hole near the bottom of the riser.

Throughout the hight of the shaft convenient openings should be provided, closed with easily opened doors, to help the descent of the ore should this be found necessary. Large cleaning doors should also be located near the bottom, kept tight during the operation but allowing of easy cleaning.

Heating of Cupola.

The heating of the cupola may be done either by means of blast furnace gas or hot blast or hot air. In the following I propose to submit these three methods of heating to a more detailed examination as to their fitness, their efficacy and their economy.

Heating With Blast Furnace Gas.—Owing to the temperature to which the ore will be heated there is no fear of absorbing any of the sulphur carried by the gas. We shall figure out hereafter how much blast furnace gas will be required to heat the ore and lime mixture either to 500 or to 800 degrees C., and we shall also give the probable amount of hot blast necessary for the same purpose, should this latter mode of heating be preferred.

In the table of heat calculations we purposely adopted temperatures of 500 and 800 degrees C. for the ore because the hot blast generally varies between these two extremes. It may seldom reach 800 degrees C. (1472 degrees F.), much less be kept at that point for any length of time, but at times it will fall to 500 degrees C. (932 degrees F.). Within these limits of temperature the table shows that good, practical results of final temperatures can be obtained. The heating must be enough to (1) evaporate the moisture of the ore, (2) to heat the ore and lime mixture to either of the extreme temperatures of 500 and 800 degrees C.

We have shown that 22.98 kg. of dry ore and 9 kg. of lime, or a total mixture of 31.98 kg., are necessary to refine 100 kg. of pig iron. We assume that the purifying ore contains 10 per cent. of moisture to be evaporated in the purifying vessel, or a total amount of mois-

ture of $\frac{22.98}{0.90} = 2553$ kg. As it will require 636 calories to evaporate 1 kg. of moisture, and taking the specific heat of dry ore and lime mixture to be 0.19, it will take the following amount of heat to theoretically heat to 500 degrees C.:

Owing to the fact, however, that the products of combustion, when leaving the apparatus, carry away some heat and that an additional quantity is lost through radiation and other causes, quantities which it is impossible to estimate, we assume that 75 per cent. more heat will be required than above figured on. These 75 per cent. should cover it, since in blast furnace practice it is customary to add only from 25 to 40 per cent. to the theoretically established heat balance to cover the heat carried away by radiation, cooling water and blast furnace gases. The total amount of heat necessary will then be: $4,661,508 \times 1.75 = 8,157,639$ calories. This heat must be supplied by blast furnace gas, for which we assume the following average composition:

N = 52.00; CO = 27.00; $CO_2 = 18.00$; $CH_4 = 0.40$; H = 1.0; $H_2O = 2.50$.

^{*} Continued from page 992, The Iron Age, March 23.

Applying to each component part its calorific power the heat developed by the gas will be:

	Cal	ortes.
CO, 0.27 × 2,400 =		648
CH ₄ , 0.004 × 11,850 =		
H, $0.001 \times 29{,}161 = \dots$		29.2
Total heating capacity of gas		724.6

Say 725 calories. Then it will require:

$$\frac{8,157,639}{725} = 11,250 \text{ kg. of gas.}$$

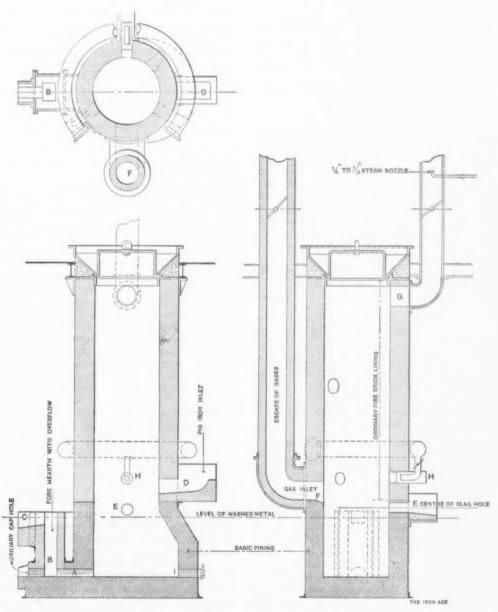
Heating to 800 degrees and considering that in either case the amount of heat necessary to evaporate the mois-

gives 6657 kg. The average of all these figures is 5850 kg. of gas per ton of iron made, or 585,000 kg. per 100 metric tons of iron. Hence the gas necessary to heat the ore and lime required to refine 100 tons of iron will be:

(1) When heating to 500° C. (932° F.) $\frac{11,250}{585,000} = 1.92$ per cent.

(2) When heating to 800° C. $(1,472^{\circ} \text{ F.})$ $\frac{15,650}{585,000} = 2.67 \text{ per cent.}$

of the total amount of gas made in the blast furnace in the manufacture of the same weight of pig iron. This amount of gas, covering in our opinion more than what



Apparatus for Refining Pig Iron.

ture will remain the same, we find that it will take:

 $\frac{11,347,644}{725} = 15,650$ kg. of gas.

As will be shown presently, this is only a small percentage of the amount of gas made in the manufacture of the same quantity of 100 tons of pig iron in the blast furnace.

In his paper, "The Blast Furnace as a Power Plant," E. A. Uehling shows that there are produced 4810 kg. of gas per ton of iron made in the furnace, with a given burden. In a similar paper, based on a different burden, M. Dutreux of Paris shows in Le Genie Civil 5500 kg. in one and 5850 kg. in another case. In Stahl und Eisen, May 1, 1901, p. 446, in a paper on the "Application of Blast Furnace Gas as a Power," Mr. Luermann gives in one case 6400 kg., and a little further on for another case 5850 kg. In the same journal, June 1, 1903, Dr. C. Woldeck

will ever be required in practice, is trifling, and its use for the above purposes will in no way interfere with the balance of the blast furnace department.

Cost of Heating With Blast Furnace Gas.—This cost can be closely estimated in the following way: Blast furnace gas may be used to great advantage to raise steam or heat the blast or in other ways, and its value may be estimated by a comparison with the amount of coal that it would require to perform the same duty. Supposing the heating value of a given coal to be 8000 calories per kilogram, which corresponds to the heating value of the average coal, then the above blast furnace gas, with a heating capacity of 725 calories-per kilogram, is $\frac{8000}{725} = 11.03$, or, say, 11 times less valuable than an equal weight of coal. If this coal is worth an average price of \$2.50 a ton (its value of course varies according

to circumstances) the value of the gas necessary to heat the ore to either 500 or 800 degrees C. will be $\frac{11,250 \times 2.50}{11} = \2.55 per 100 tons of pig iron treated when heating to 500 degrees C., or 2.55 cents per ton of pig iron treated, and $\frac{15,650 \times 2.5}{11} = \3.55 per 100 tons, or 3.5 cents per ton, of pig iron treated when the operation is to be performed at \$000 degrees C. The heating cost

3.5 cents per ton, or pig fron treated when the operation is to be performed at 800 degrees C. The heating cost when using blast furnace gas for that purpose is therefore trifling and may practically be neglected. In case of necessity, producer gas, provided for that special purpose, could be used advantageously with only little added cost.

The burning of the gas should be done with an excess of air, so as to burn it entirely before it penetrates the ore, thereby avoiding a premature reduction of the latter. Theoretically it would require 77.5 pounds of air to completely burn 100 pounds of the above blast furnace gas. In practice we should have about 1 air for 1 gas to insure complete combustion, as is done in gas engines

Heating with Hot Air.

working with blast furnace gas.

Amount of Air Required.—If the heating is done with air every danger of premature reduction will be avoided. Although such a heating will be much more expensive we shall still figure out the amount of air necessary. For convenience sake in the calculation we assume that the hot blast after having expanded from its blast furnace pressure to ordinary atmospheric pressure, thereby losing some of the heat carried by it, will enter the cupola at respectively 500 and 800 degrees C., that its specific heat is 0.237 and that 75 per cent. more air will be required than theoretically necessary.

Heating to 500 degrees, as already shown, demands 8,157,639 calories. The heat carried by 1 kg. of air at 500 degrees C. is $5\times23.7=118.5$ calories. The amount

of air necessary is
$$\frac{8,157,639}{118.5} = 69,100$$
 kg.

The total amount of blast blown into the furnace in the manufacture of 100 tons of pig iron may be approximated when we consider that the nitrogen contained in the gas is derived from the air blown in. This is not entirely correct, but sufficiently approximate for present purposes. Since 1 kg. of gas contains 0.52 of nitrogen the whole amount of nitrogen per ton of pig iron made will be $0.52 \times 5850 = 3042$ kg., and for 100 tons 304,200 kg. 304,200

of nitrogen, so that $\frac{304,200}{77} = 395,065$ kg. of air is blown into the furnace for each 100 tons of pig iron made.

In the refining of 100 tons of pig iron we need therefore for heating purposes $\frac{69,100}{395,065} = 17.5$ per cent. of the

amount of air required in the manufacture of 100 tons of iron when heating the ore to 500 degrees C. In the same way we find that it would take for refining 24.34 per cent. of the quantity of air required in the blast furnace to make 100 tons of pig iron when heating to 800 degrees C. If this blast cannot be taken from the regular supply of hot blast then about 25 per cent. more blast power should be provided for that purpose. The use of such hot blast, which in itself will cost much more to produce, is therefore not to be recommended, although in case of necessity its use could still be resorted to with undoubted advantage and economy.

Instead of using blast furnace gas for direct heating or using hot blast it might be found more economical to use hot air at the ordinary pressure, from a kind of regenerator chamber, heated up by gas.

These considerations show that the heating of the ore and lime mixture can be done economically and practically in different ways in the purifying apparatus itself.

The table on heat calculation shows, furthermore, that when the cupola and the ore and lime mixture are previously heated to a temperature of 500 degrees C. (about incipient red heat), the final temperature of the purified metal will be 1263 degrees in the case of pig iron running directly from the blast furnace at 1400 degrees C. This final temperature is still 23 degrees higher than the

hottest temperature of Bessemer iron running from the cupola observed by Mr. Thompson.

Even should the ore be heated up to only 400 degrees C. (720 degrees F.), calculation shows that the temperature of the finished metal obtained from pig iron run directly from the blast furnace would still be above 1200 degrees C. With ore heated up to 800 degrees C. (incipient cherry red heat) the final temperature of the purified metal is 1356 degrees, or 116 degrees higher than the highest temperature of Bessemer pig running from the cupola.

It will be observed that with a temperature of 1400 degrees C. for the liquid pig iron as it runs from the blast furnace the final temperature of the purified metal will increase 33 to 34 degrees C. with each 100 degrees increase in the temperature of the purifying ore. This shows that while good results will be obtained with the stated conditions it is of advantage to heat the ore to a high temperature. On the other hand, we must not fall into the mistake of heating the ore to a degree where sudden and violent reactions would inevitably take place and endanger the success of the operation. This must carefully be avoided. Practice would soon decide on the best temperature to be used.

In all respects, even under circumstances less favorable than those revealed by the table of heat calculations, the calorific conditions of the operation prove to be all that can be desired.

In the calculation of temperature, the loss due to radiation has not been considered. Owing to the very short time that the operation will last such a loss would not be felt and would not influence the success to any appreciable degree. On the other hand, it would probably be correct to state that some sources of heat supply have not been considered in the calculations.

It is well known that while silicon and phosphorus are eliminated through oxidation from the pig iron as silicic acid and phosphoric acid, they are not found in that shape in the slag. They in their turn unite again with the oxides of iron and manganese eliminated as well as with the lime to form silicates and phosphates. The chemical reactions thus taking place afford another and probably important source of heat supply that has not been considered heretofore, but that will nevertheless help to further increase the temperature of the final product.

The fact may also be noted that although the table of heat calculations shows the final metal to have a lower temperature than the original pig iron, it is almost invariably observed in the practice of the Krupp process and similar experiments where only little carbon is removed that the temperature of the refined metal is always much higher than the temperature of the original pig iron treated. In the Krupp process this higher temperature of the refined metal will certainly be due partly to the high temperature to which the purifying ore is heated, but in the Uehling experiments the ore was not heated much, being practically only dried, yet the temperature of the purified metal was found to be higher than the temperature of the pig iron from which it was obtained. The amount of heat developed when silica and phosphoric acid unite with bases, such as lime, oxide of iron and oxide of manganese, has been established by Berthelot and other scientists and may be found in their books. To apply such figures to our case would be preposterous without knowing the correct ratios in which silica and phosphoric acid unite with the bases in the slag. We do not pretend to do it here; we simply desire to point out the sources of heat supply.

Economical Considerations.

It is a difficult matter to establish beforehand the economical conditions of a process which naturally would be greatly influenced by local conditions, quality and price of purifying ore, quality of the raw pig iron treated, analysis of the purified metal obtained, and to a large extent by the market conditions of pig iron and steel, which latter not only change from one locality to another but are subject to great variations at different times.

In some of our Northern districts a purifying hematite ore of the kind considered in this paper could be bought at a very fair price. A magnetic ore with at least as much iron content and considerably less silica could be obtained at even more favorable prices. But both of these ores would cost considerably more in our Southern districts. Still, it may be stated here that while Lake Superior hematite was taken as a basis in the calculations the process is not limited at all to this class. In the first place it has been shown that in order to refine 100 tons of iron 23 tons of a 60 per cent. iron ore were necessary. To this there were added 9 tons of lime, bringing it up to a total of 32 tons of raw material. In other words, for each 100 tons of ore 39 tons of lime are added, so that 139 tons of raw material contains 60 tons of metallic iron, corresponding to an iron ore of 43 per cent. of iron and 4.74 per cent of SiO2, which shows that an ore with considerably less iron content would give chemically and calorifically the same result and could be used to good advantage. Magnetic ore may also be used. The trouble encountered then would be a lower temperature of the purified metal. A rough calculation, which it is not necessary to reproduce, shows that under the same conditions in other respects the temperature of the refined metal would probably be some 30 degrees C. lower than with the use of hematite. Still, even under said conditions the final temperatures would be found sufficiently satisfactory for all practical purposes.

To what extent magnetic ore might be inferior to hematite from other than calorific considerations would be best determined by practice. Naturally the richer the iron ore and the lower its silica contents the less ore and lime is required and the more favorable will be the calorific conditions of the process.

In the choice of the ore to be taken there is therefore enough latitude to make the process successful under widely varying conditions. Although, as stated above, the economical status of the process will vary with the market conditions and therefore it will be difficult to establish figures in that respect, some data may be submitted that can be applied to the case considered, where it was assumed that 4.17 parts of impurities are removed from the iron with a reduction of 8.889 parts of iron from the ore.

The total theoretical gain would be 8.889 — 4.170 = 4.718 per cent., meaning that for each 100 parts of raw pig treated the theoretical yield in the purifier would amount to 104.718 per cent. There would still remain to be eliminated in the open hearth the carbon and the balance of the impurities left in the iron. The rapid elimination of these impurities by means of oxide of iron would afford no difficulty owing to the small amount of slag present. The yield obtained in the open hearth should be more that 100 per cent. If there be taken as a criterion the yield obtained in other processes of a somewhat similar nature, such as the Monell or the Talbot process, both of which work on similar lines. In some cases even a yield of 106 per cent. is claimed.

The combination of the two operations, preliminary refining in the purifier and the finishing in the open hearth, constitutes a kind of duplex process comparable to the Bessemer open hearth duplex, the only other process that could easily be adapted to the treatment of an iron with 2 per cent. of silicon and 1 per cent. of phosphorus, with the difference, however, that the refined metal from the purifier would be practically free from silicon and phosphorus, without having lost any appreciable amount of carbon, while the preliminary metal obtained from the Bessemer converter in the Bessemer open hearth duplex loses all its silicon and a large amount of carbon, but still retains all its phosphorus. In other words, the latter metal with all its phosphorus left, when too much carbon is removed from it in the preliminary Bessemer, is not as good a metal for open hearth purposes as a metal with no silicon, little phosphorus and practically all its carbon. For these reasons the method proposed is far superior to the Bessemer open hearth duplex. For reasons shown hereafter this superiority is further enhanced.

The great drawback militating against the use of the Bessemer open hearth duplex, outside of the danger of pushing the preliminary refining in the Bessemer too far, lies in the great loss of metal that it entails. This

loss, it is stated, amounts to at least 15 per cent., of which at least 9 per cent, is due to Bessemerizing and about 6 per cent. to the open hearth work. Against this loss of 9 per cent. in the Bessemer the proposed method shows a gain of 4.718 per cent. in the case of hematite as oxidizer. It would show a gain of 6.211 per cent. in the case of magnetite. Compared with the loss obtained in the preliminary Bessemer the total gain could vary from 9 + 4.718 = 13.718 to 9 + 6.211 = 15.211 per cent. This gain is entirely limited to the preliminary refining operation. For reasons above given a further gain over the metal obtained from the Bessemer might be expected in the open hearth. Still, in order to remain conservative in the estimation, it may be assumed that 100 parts of pig iron yield only 100 parts of steel, or a gain of 15 per cent. over the Bessemer open hearth duplex. This yield of 100 per cent. is certainly conservative, but it means that for each 100 tons of pig iron treated 15 tons more steel are obtained than when using the Bessemer duplex.

Steel billets to-day are quoted at \$23 a ton. Subtracting from that price the sum of \$3 to cover all expenses for rolling ingots into billets \$20 is reached for the value of 1 ton of steel in ingots.

Now, 23 tons of ore and 9 tons of lime are required to treat 100 tons of pig iron. As lime would be required in the ordinary basic open hearth as well it need not be considered. In the Southern district, where the pig iron considered is principally made, good, rich iron ore of the kind indicated would probably cost \$7 a ton. Under such conditions the balance sheet, on the basis of a gain of 15 tons of ingots, would stand as follows:

Gain due to steel,	15 ×	20 =\$3	00
Expenses for ore,	$23 \times$	7 = 1	

Total net gain per 100 tons treated......\$139
Or \$1.39 a ton. Even should the refining ore cost \$7.50
a ton the net gain would still amount to \$139 — \$11.50
= \$127.50, or \$1.27 a ton of steel.

But the prices quoted should only be considered as applying to the conditions of this special case. There may be substituted for them the ruling market prices for ore, pig and steel in the different localities.

There is no doubt that in many places a rich hematite or magnetite, perfectly suitable for advantageous use in such a refining process, may be bought at a much lower price than \$7 a ton. With the use of a lower priced ore the gain would be correspondingly increased.

On the other hand, the process need not necessarily be limited to the treatment of the highly siliceous iron here considered. An iron with less silicon and phosphorus may be treated in this preliminary way. Naturally with less impurities to be eliminated a correspondingly decreased amount of ore will be required.

Whatever these conditions one thing is certain: the iron reduced from the ore in the refining and incorporated in the metallic bath is obtained without the cost that it would necessitate were the ore reduced in the blast furnace, with the use of much labor and fuel. The process proposed takes advantage of the excess of heat otherwise lost, which is stored in the pig iron running from the blast furnace, and of the very impurities that must be removed from it to recover from the ore a corresponding quantity of iron with little labor and practically no fuel. It is therein that the great economy of the process lies. This economy is still further emphasized by the fact that the use in the open hearth furnace of the refined iron so produced will be the direct cause of shorter and consequently more numerous heats. with all the economical advantages resulting therefrom.

The repairs to the cupola used for refining purposes will be small and really limited to the lining, which should be basic, at least in the purifying zone. It may be made of dolomite or magnesite. Dolomite linings are good and cheap. They are nearly exclusively used in basic Bessemer converters, where the slag is of a character very similar to that obtained in this process. The writer has made and used such linings for years. Well made they will last from 100 to 150 heats, and then need only partial repairing. They are easy to make and easy to repair. Their use will reduce the repair cost to a minimum.

THE IRON AGE

1855-1905

New York, Thursday, April 6, 1905.

DAVID WILLIAMS COMPA	NY,	0	-		10	-		PUBLISHERS.
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GEO. W. COPE,			-	-	•		-	ASSOCIATE EDITOR.
RICHARD R. WILLIAMS,						-		HARDWARE EDITOR.

The Publicity Work of the Interstate Com-

Beyond doubt the Administration party will make strenuous efforts at the next session of Congress, whether it be a special or the regular session, to bring Senators into sympathy with railroad rate legislation in substantially the form embodied in the bill which passed the House almost unanimously on February 9. From the nature of that vote—326 to 17—and the general attitude of the Administration on all matters, it may be accepted that no substantial modification will be entertained if there is any hope of maintaining the original ground.

One point in the general question of Federal supervision over the railroads does not seem to have been given sufficient weight. Following the Elkins-Mann act, approved February 19, 1903, and which increased the power of the Interstate Commerce Commission in the matter of discriminations, a general order was made by the commission to investigate the terminal railroads of the country. This investigation has been prosecuted cather slowly, but it has covered a great deal more work than the public appears to realize. Extensive hearings were held in regard to terminal lines in Chicago last year. Next came early this year a hearing in Pittsburgh relating solely to the divisions on coal and coke, and this was followed by a more general one regarding terminal railroads at St. Louis. The testimony in the Chicago terminal industrial line case was printed, as well as the opinion of the commission, the decision being dated November 3, 1904. The testimony in the Pittsburgh and St. Louis cases has not been printed, and probably will not be, but the hearings were wholly public.

Thus far only a small part of the ground has been covered, but the commission is proceeding with deliberation and its work is very thorough. It is fully empowered to compel witnesses to testify and to produce books and papers. In the hearings thus far held no difficulty has been found in having witnesses from the railroads speak out; they have told frankly the exact nature of the divisions made with terminal railroads, and while, when asked their personal opinions as to whether the divisions were excessive, they have generally testified that they did not regard them as such, their testimony on this point is immaterial. The commission proceeds upon the facts and forms its own conclusions; it has regard to grades, curves and all technical points which have a bearing. The facts unearthed in the Chicago investigation led to an opinion on the part of the commission, the language of which is explicit and forcible, condemning certain of the practices and positively placing them in the category of things prohibited by the original act of 1887 and the Elkins amendment of 1903.

It is somewhat surprising that while the terminal railroad, with its division of the through rate, is substantially as old as the Interstate Commerce law, comparatively little public attention has been directed to it. The fact gives all the more ground for the expectation that the present investigation, on the general order of the

Interstate Commerce Commission, will be productive of real results.

In essence this investigation is a matter of publicity. The Administration has, on the surface, made a bold stand for publicity in all matters, yet when the test has come it has worked for the passage of a new law, perhaps promising serious discomforts for the railroads, but hardly offering to the shipper and consignee something which he greatly needs, and which could not be otherwise obtained, and has not put forth the much slighter effort which would have been needed to hasten and make more emphatic the publicity work of the Interstate Commerce Commission under existing laws. It does really seem that if the Administration had had faith in its convictions on the value of publicity it would have pushed this work more than it has. There is no desire here to question the value of publicity, but rather to raise the question whether the Administration has the faith it professes in its own propaganda. Publicity is a wonderful force, exemplified in many ways. The iron and steel trade has seen its strength in many instances. Not the least of these is the so-called "Billet Association." Formed at a time when there was considerable cutting of crude steel prices, and stories of vastly more told by those who desired to obtain concessions for themselves, this association, by a simple system of publicity-strictly among its own members-stopped all abuses and gave its members confidence in themselves and in each other. Nothing more seemed to be necessary than to make public -within the chosen circle-what was actually being done, explicity as to tonnages, prices, analyses and terms of delivery, to stop all abuses and bring about the conditions which were desired. It can safely be said that the whole strength of the Billet Association (not, of course, the strength of the steel market itself) has been publicity.

That the work of the Interstate Commerce Commission concerning terminal railroads is in substance a matter of publicity is apparent from a concrete case. The "report and opinion" of the commission in the Chicago case winds up by saying: "This being a general investigation, in which no specific charges have been formulated against particular defendants, no order can be made, nor would any order apparently add to the prohibition of the statute itself. The inquiry will be continued into other similar practices, and whatever means the law affords employed to stop those above referred to."

This, as the closing paragraph of a report and opinion occupying 20 printed pages of plain facts and positive statements of violations of existing law, points clearly to the force of the work being strictly in the line of publicity. The commission did not refrain from making an order because it was not clear as to what was being done or as to whether this was illegal. It gives as its finding that certain railroad companies gave to terminal roads certain divisions, and that "this act sprang, not from motives of generosity or the dictates of justice, but from the desire and expectation to thereby obtain traffic not otherwise obtainable." Of these divisions its opinion is that they " are much in excess of any fair charge for that service; that they are intended and understood to be in excess of what would be a reasonable charge; that they are, in fact, paid to secure the traffic of" the company which controls the terminal road. Further, the commission weighed the preferences given to different interests and compared them.

If the greatest abuses in railroad rates at present are those arising out of divisions to terminal railroads, and if the Interstate Commerce Commission so clearly finds that such abuses are contrary to the interstate commerce law, especially as amended by the Elkins act, then one

must wonder why there is so much appearance of faith on the part of the Administration in a prospective law and so little appearance of reliance on the present law.

Our Foreign Trade and National Prosperity.

The decrease in the favorable balance of trade of the United States and the increase in gold exports in recent months have given much disquietude to those who take a near sighted view of the situation. We are assured that the country is running behind, that we are feeding the world with gold instead of bread, that our boast of having the cheapest money market in the world may be short lived and that our present trading is at fictitious values based on past prosperity. The argument brought up to date is in substance that the balance of trade in the eight months ended February 28, 1905, is \$281,000,-000, against \$393,500,000 in the eight months ending a year previous; that imports in February, 1905, were the largest of any month in the country's history, while exports were smaller than in the two preceding Februaries, and that since last September there has been an excess in the exports of gold.

The reasoning is very largely specious. It is a logical necessity that one must first prove that he is reasoning from cause to effect. There are here given certain facts, and it is assumed, with considerable justice, that certain unknown things can be derived from them, but the assumption is wholly unwarranted that the unknown things stand in the relation of effect. A broader view shows that the unknown things are causes and not effects. There are so many elements which represent the final disposition of the balance of trade that it has always been difficult to classify and proportion them to each other, even when the ground is assumed that the balance of trade is exactly offset by these elements, which include erroneous valuations of imported and exported material, freights paid to foreign owned vessels, the movement abroad and return of American securities, interest and dividends paid to foreign holders of American securities and money spent by Americans traveling abroad. To these elements, which have always been considered in such analyses of the liquidation of our balance of trade, the necessity has but lately arisen of adding loans made abroad by Americans and the interest return on them.

Even without definite guidance from the experience of all the past, it would be utterly unsafe to assume that the recent decrease in the balance of trade will prove to be a cause of future disaster rather than to assume that it is the logical working out of the influences just cited, which are obviously well able to take care of themselves. The statistical record, however, is perfectly clear in its lesson that at no time has it been possible to predicate either prosperity or adversity upon the movement of the balance of trade. Thus in the fiscal years 1850 to 1873, inclusive, there were but two years in which merchandise imports did not exceed exports, and but one year in which gold and silver exports did not exceed imports, the sum of the two, again, showing ten years in which the combined exports were greater and 14 years in which the combined imports were greater. In the following period, embracing the fiscal years 1874 to 1904. inclusive, there were but four years in which merchandise imports exceeded exports, but seven years in which gold and silver exports exceeded imports, and but two years in which the combination did not show greater exports than imports.

This striking change, comparing contiguous periods

24 and 31 years long, respectively, could, with absolutely no knowledge of current conditions, be set down with confidence as an effect and not a cause. No cause could possibly require anything like so long a period of time to show results. The fact is, however, that the causes of this change are perfectly well understood and are amply sufficient to produce the result.

It might be argued that while over long periods of time the nature and size of the balance of trade are effects and not a cause, the same rule does not hold good over shorter periods. To answer this possible claim it is well to deal with gold and merchandise separately. As to gold, the movement since the beginning of 1899 has been too small to be a cause for anything. In the five calendar years since 1899 the minimum number of months in any year in which an excess of gold exports was shown was four, while the minimum number in which an excess of imports was shown was five. The gold has been simply going back and forth, making round trips at least as often as once a year. Since net gold imports of \$142,000,-000 in 1898, the greatest net imports have been \$21,000.000 in 1903 and the greatest net exports \$36,000,000 in 1904. The Government returns show the gold coin in the country, including bullion in Treasury, as follows:

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January	1,		19	0	1									 															 		1,	1	0	8,	54	1	.8	21	3
January	1,	1	19	0:	2									 				0		0		0	0	0							1.	1	7	6,	17	2	,1	5.5	3
January	1,	4.4	19	0	3	0		0		0			0	0		0	0	0	0	0			0	0							1,	2	4	6,	87	6	,7	13	5
January	1,	1	19	0	4							0	0			0		0		0	0		0						 		1,	3	1	4.	62	22	,5	2.	į
January	1,	*	19	0	5					0	0		0	0	0	0	0	0	0	0			0	0	0	0		 	 		1,	3	4	5,	9	12	,5	3:	5
February	1,	*	19	0	ŏ	0			0)						*			10											 	6 7	1,	,3	4	1,	20	06	,4	5:	2

If, as claimed, the United States is feeding the world with gold instead of bread, the world is getting only crumbs from a heavily laden table. This surely disposes of the contention as to gold. As to merchandise, the answer is just as simple: A decrease in exports has never been shown to be a sign of adversity. Indeed, in some cases, particularly in the iron and steel trade proper, large exports are a sign of adversity. Naturally, if statistics be searched, plenty of cases can be found where large exports have preceded prosperity, and where small exports have preceded adversity. To cite such facts as a proof is another case of transposing cause and effect. If large exports are an accompaniment of hard times, they naturally precede good times. Bad times and good times alternate with each other because they have nothing else to alternate with, and everything that occurs in bad times precedes good times. They are not the cause of good times unless hard times are the cause of good

But these prophets of evil raise another point: They urge that our exports of breadstuffs and cotton have greatly decreased. Have they decreased because the wheels of commerce have slipped some cogs or because the country is prosperous and a better consumer of these articles? It is nature which gives crops to man, who merely makes the distribution. With manufacturers it is man who produces and also distributes. It is surely no misfortune that the products of agriculture are kept at home and that manufactures are exported. Of manufactures the country can increase its production if the world will take the increase; of the products of agriculture it must stint itself to give an increase to the world. The record of imports and exports in the past two years shows with the greatest clearness that as to imports there has been an increase in articles of food, animals and crude materials and a decrease in articles of manufacture, luxuries, &c., and as to exports a decrease in the products of agriculture and an increase in manufactures. Comparing the calendar years 1903 and 1904, there was an increase in total imports of \$40,415,000. There was

an increase in articles of food, animals and crude materials of \$76,439,000. These items in 1904 constituted 53 per cent. of the total imports. Other lines of imports showed a decrease. Comparing exports, the decrease in the total was \$31,900,000; the products of agriculture decreased \$118,920,000, still constituting 63 per cent. of total exports, while the products of manufacture increased \$81,310,000, although constituting but 29 per cent. of the total. The products of mining, forest, fisheries, &c., showed no important change.

Thus it seems evident that while the recent movement in international exchanges of merchandise and gold furnishes no ground for prophecies of adversity to follow, an analysis indicates that there may rather be found some good auguries therefrom. So far as iron and steel are concerned, whatever they are to show will be in the future. While the comparison of total exports shows a decline, iron and steel in the seven months ended with January show an increase from \$59,126,000 to \$79,517,000. Possibly these exports will later show a decrease, but no one can possibly claim, in such a case, that the decrease proves anything but a condition of extreme prosperity at home. It may be also that the iron trade is figuring in the international balance through securities of the United States Steel Corporation sold abroad, just as in the past a large mass of railroad securities went abroad, only to come back in a more recent period. Such movements cannot be traced. Stock speculators would be only too glad to do so, and where they fail it is useless for others to make the attempt.

Coke Ovens at Gas Works.

The advantages accruing to large city gas companies from the ownership or control of sources of their coke supply as embodied in by-product coke ovens are so great that such companies are seriously considering the adoption of the system. How the erection of by-product coke ovens in connection with gas works in our larger cities will affect the present coke industry is easy to imagine. To be operated economically, each plant of the kind must inevitably produce more coke than the gas company will require, the surplus going into the market in competition with the present coke operations. The gas company, making water gas, that buys its coke in the open market, not only pays a profit to the coke operator but also pays higher freights and switching charges on coke than it would pay on coal. Add to the savings that would be effected in these lines the inducements offered by the promised profits on tar, ammonia and other by-products, and it is easily seen why gas companies with surplus capital are seriously considering the erection of by-product coke plants. Self protection also enters into the argument, because the control of the local situation in any city is menaced as long as there is a possibility that some other interest may erect a by-product coke plant and thus become a competitor in the sale of gas. A typical example of this was furnished by the city of Milwaukee, where Solvay ovens were erected by an independent company, which appealed to the City Council for permission to pipe its gas through the streets of the city, offering cheap gas as its argument. What could the local gas company do but agree to buy this gas on the Solvay company's terms, whether it needed it or not? A similar situation will soon confront the gas company that controls the southern wards of Chicago unless, which is probable, it has already come to terms with the company that is erecting a 120-oven plant on the Calumet River. While there are counter arguments, the advantages that will accure to any large gas corporation by the installation of its own by-product ovens make it probable that many of such plants will be built in the near future. This will necessarily mean cheaper coke to the fortunate furnace and foundry interests within the zone of such operations.

Labor Fighting Boston's Freight Tunnel.

Boston's projected freight tunnel connecting the terminals, both railroad and water, at the north and south ends of the city, is meeting with strong opposition from the local labor unions. The unions seem to be unable to look at the question with the broadness which it deserves when considered with the interests of labor in The operation of freight tunnels might take away the present occupation of teamsters, but it would at the same time provide employment, directly and indirectly, for a great many more men than would be the sufferers. Labor quickly conforms to new conditions. When a great work is accomplished for the general good of a community, to better its industrial and mercantile facilities, as, for instance, to quicken and cheapen transportation, the result must always be for the best interests of labor. More men will be employed in the community than would have been the case if the improvement had not been made. The general welfare of Boston would be greatly benefited by the system of tunnels. The city's importance as a shipping point would be increased, because quicker and cheaper means of handling freight would be provided. It is a costly matter to cart freight through a great city. The freight tunnel project has not progressed far. The plan is still in a tentative condition. The problem is being worked out, however, and the more the plan is unfolded and discussed the more desirable it appears to be from all points of view excepting the present view of the labor unions. In a general way the plan is to build several tunnels, a part of the system to be of sufficient size to take the ordinary freight car, and the rest of it of smaller dimensions to be traversed by special cars of smaller size. It is highly improbable that the complaint of the labor unions, voicing the protests of a very small minority of the people affected, will militate against the carrying out of any project if that project is demonstrated to be for the public good and be practicable as an engineering problem and as an investment.

Japanese Commercial Ethics.

Americans who have been in the Far East and have had business dealings with Japanese merchants and manufacturers will recognize the importance of the remarks of Baron Sone, Japanese Minister of Finance, at a recent mass meeting of Tokio merchants, in which he dwelt upon the suicidal tendency of the manufacturers of his country to destroy their excellent beginning in the markets of the world by their sharp practices. The Japanese Government has been entirely honest in its dealings connected with the war. In all departments of the army the most scrupulous care appears to have been taken that no cause for the charge of business dishonor could be made against the Government. But the Japanese business man has too often neglected to practice such a code. Letters from the Far East indicate that many Americans and Englishmen have felt greater sympathy for the Russian than for the Japanese arms solely because of prejudices engendered in commerce. It is the same sort of prejudice that American commerce has encountered in the past because of the practices of many of the pioneers in foreign trade. The United States has seen the time when it could throw no stones at Japan or any other nation on account of methods pursued in commerce with other countries. But times have changed. Business men have become either wiser or more honorable in their dealings with foreigners. Japan will learn the lesson in time that nothing in business life is so improvident as the failure to live up to agreements, whether as to quality or quantity of goods or as to matters of money.

The New Trade-Mark Law.

Rules for its Enforcement Officially Promulgated.

Washington, D. C., April 4, 1905.—The Patent Office is about to issue a series of rules and regulations for the execution of the new trade-mark law, which went into force on the 1st inst. The new statute makes many important modifications in the old law, and the new regulations are therefore of much importance to trade-mark owners. Through the courtesy of the Commissioner of Patents the correspondent of *The Iron Age* is enabled to present an advance abstract of the chief provisions of these rules.

Applications.

An application for the registration of a trade-mark must be made to the Commissioner of Patents and must be signed by the applicant. A complete application comprises: a, A petition requesting registration, signed by the applicant; b, a statement specifying the name, domicile, location and citizenship of the party applying; the class of merchandise and the particular description of goods comprised in such class to which the trade-mark is appropriated; a description of the trade-mark itself, and a statement of the mode in which it is applied and affixed to the goods, and of the length of time during which the trade-mark has been used; and if the applicant be a corporation or association, it must set forth under the laws of what State or nation organized; c, a declaration, complying with section 2 of the statute; d, a drawing of the trade-mark, which shall be a fac-simile of the same as actually used upon the goods; e, five specimens (or facsimiles when, from the mode of applying or affixing the trade-mark to the goods, specimens cannot be furnished) of the trade-mark as actually used upon goods, and, f, a fee of \$10.

No information will be given without authority of the applicant respecting the filing of an application for the registration of a trade-mark by any person, or the subject matter thereof, unless it shall, in the opinion of the Commissioner, be necessary to the proper conduct of business before the office.

A trade-mark registered under the act of March 3, 1881, may be registered under the act of February 20, 1905, but the application for such registration will be subject to examination in the same manner as other applications filed under said act of February 20, 1905.

In proceedings relating to an application or a registration under the act of February 20, 1905, it shall be deemed sufficient to serve notice upon the applicant, registrant or representative by leaving a copy of the process or notice of proceedings addressed to him at the last address of which the Commissioner of Patents has been notified.

Form of Declaration.

The application must be accompanied by a written declaration verified by the applicant, or by a member of the firm, or by an officer of the corporation or association applying, to the effect that he believes himself, or the firm, corporation or association in whose behalf he makes the declaration, to be the owner of the trade-mark sought to be registered, to the best of his knowledge and belief; has the right to use the trade-mark, either in the identical form or any such resemblance thereto as might be calculated to deceive; that such trade-mark is used in commerce among the several States, or with foreign nations,

or with Indian tribes, and that the description, drawing and specimens (or fac-similes) truly represent the trade-mark sought to be registered.

Where application is made under section 5 of the act of February 20, 1905, on the ground that the mark has been in actual and exclusive use as a trade-mark by the applicant, or his predecessors from whom he derived title, for ten years next preceding the passage of said act, the applicant shall, in addition to the requirements of section 2 of said act, make oath to facts showing such actual use for the period specified, and that, to the best of his knowledge and belief, such use has been exclusive for the period specified, and that the mark is now and has been continuously used by the applicant, or his predecessors, or by those from whom title to the same is derived, as a trade-mark.

The declaration may be made before any person within the United States authorized by law to administer oaths, or, when the applicant resides in a foreign country, before any Minister, chargé d'affaires, consul or commercial agent holding commission under the Government of the United States, or before any notary public, judge or magistrate having an official seal and authorized to administer oaths in the foreign country in which the applicant may be.

The drawing must be made upon pure white paper of a thickness corresponding to two-sheet Bristol board. The surface of the paper must be calendered and smooth. India ink alone must be used, to secure perfectly black and solid lines. The size of a sheet on which a drawing is made must be exactly 10 x 15 inches. . . . The Patent Office, at the request of applicants, will furnish the drawing at cost.

Interferences.

In case of conflicting applications for the registration of a trade-mark, or in any dispute as to the right to use it which may arise between an applicant and a registrant, the office will declare an interference, in order that the parties may have an opportunity to prove priority of use, and the proceedings on such interferences will follow, as nearly as practicable, the practice in interferences between applications for patents.

Any person who believes he would be damaged by the registration of a mark may oppose it by filing, in duplicate, a written notice of opposition, stating the grounds therefor, within 30 days after the publication of the mark sought to be registered.

Any person deeming himself to be injured by the registration of a trade-mark in the Patent Office may at any time make application to the Commissioner to cancel the registration thereof. Such application shall be filed in duplicate.

Assignments.

Every registered trade-mark and every mark for the registration of which application has been made, together with the application for registration thereof, shall be assignable in connection with the good will of the business in which the mark is used. Such assignment must be by an instrument in writing and duly acknowledged according to the laws of the country or State in which it is executed.

Schedule of Fees.

The regulations for the enforcement of the new law provide the following schedule of fees:

For recording every assignment, agreement, power of at-	
torney or other paper of more thon 1,000 words 3.0	0
For the certificate of search 1.0	0
For each brief from the digest of assignments	0
For searching titles or records, one hour or less5	0
Each additional hour or fraction thereof	0
For a single printed copy of statement, declaration and	
drawing	
If certified, for the grant, additional	
For the certificate	5

Notice of Registration.

It shall be the duty of the registrant to give notice to the public that a trade-mark is registered, either by affixing thereon the words "Registered in U. S. Patent Office," or "Reg. U. S. Pat. Off.," or, when from the character and size of the trade-mark, or from its manner of attachment to the article to which it is appropriated, this cannot be done, then by affixing a label containing a like notice to the package or receptacle wherein the article or articles are inclosed; otherwise, on a suit for infringement, no damages shall be recovered except on proof that the defendant was duly notified of infringement, and continued after such notice.

W. L. C.

New Publications.

High Temperature Measurements. Second edition, revised and enlarged. By H. Le Chatelier, engineer in chief of the corps of mines, professor of mineralogy, College of France, editor of the Revue de Metallurgie, and O. Boudouard, D.S. Authorized translation and additions by G. K. Burgess, D.S., assistant physicist Bureau of Standards. Publishers: John Wiley & Sons, New York. Pages, 341; illustrated. Cloth, \$3.

Since the original edition of this work there has been considerable advance made in the methods of measuring high temperatures, or, as it is known, pyrometry. In this edition the results of recent work have been added to appropriate chapters and the original text revised where necessary. Possibly the most that is new will be found in the chapter dealing with optical pyrometry. It contains material taken from a paper by Drs. Waidmer and Burgess. There are also considerable additions to the chapters on electrical resistance, thermoelectric and gas pyrometry. Brief descriptions have been added of some other pyrometers which have been largely used in the United States. A special chapter is devoted to the standardizing of pyrometers.

Hendrick's Commercial Register of the United States, for Buyers and Sellers. Published annually by the Samuel E. Hendrick's Company, New York City. Pages, 1300. Cloth, \$7.

The last edition of this work, which is issued annually in the interests of the architectural, mechanical, engineering, contracting, electrical, railroad, iron, steel, mining, milling, quarrying and kindred industries, contains some 350,000 names and addresses, over 1300 pages and over 1400 classifications. It aims to be the most complete and reliable index of these industries, and gives full lists of the manufacturers of and dealers in everything employed in the manufacture of material, machinery and apparatus used in these professions from the raw material to the manufactured article and from the producer to the consumer. What may have been said of the previous editions may be said of the present one, with perhaps greater emphasis—that it is invaluable to those seeking to buy or sell anything in the extremely comprehensive list of trades which it covers. The book may also be made of considerable use in preparing mailing lists covering the entire country, for which purpose its convenient classifications are of great value.

Registration of Trade-Marks Under the New Trade-Mark Act of the United States, By Arthur P. Greeley, formerly Assistant Commissioner of Patents. Publishers: John Byrne & Co., Washington, D. C. Pages, 57. Paper, 50 cents postpaid.

The author of this pamphlet is at present connected with the Patent Law Association of Washington, and was a member of the commission to revise the patent and trade-mark laws. In the comparative study, "Foreign Patent and Trade-Mark Laws," which he published a few years ago, he pointed out the shortcomings of the Trade-Mark law enacted in 1881, stating that it did not give to registers any remedy against infringers which the owner of an unregistered trade-mark would have under the common law, and that such a law did not provide for giving force and effect to the provisions of the international convention, and was in other respects unsatisfactory. The new trade-mark act which Congress has recently passed is a vast improvement on the original law, and has eliminated most of the objections, so that the owners and users of trade-marks henceforth will be afforded some substantial protection. Since the passage of this act there has been a wrong impression created to the effect that it is necessary for those having trade-marks registered under the act of 1881 to reregister. This is a misapprehension which it is the purpose of the present pamphlet to correct, while commenting upon and making plain the meaning of the new trademark law.

A Solid Wrought Car Wheel Episode.

Egbert P. Watson, Elizabeth, N. J., contributes the following interesting reminiscence:

The first attempt to make solid wrought car wheels in this country occurred within my personal knowledge about 55 years ago, in the shops of the former Morgan Iron Works, at the foot of Ninth street, East River, New York. At the time mentioned cast iron wheels were chiefly used, but they had proved so unreliable from shrinkage strains and the breaking of flanges and cracking in the hubs that they were considered dangerous. Chilled wheels had not then been brought out, and among other things a remedy was sought in wrought iron wheels. The type experimented with was a solid disk of convolute section with an adequate flange. The first desideratum was a bloom of the proper size, and this was made from wrought scrap as it came to hand, without regard to its quality-cold short, red short, all went into the pile and was supposed to be welded because it looked solid exteriorly. There was no steam hammer in the works, so the bloom had to be built up by successive heatings and a gang of strikers.

The wheels were to be pressed into shape, and as hydraulic tools large enough for the work were not available, recourse was had to a geared toggle joint arrangement mounted in a suitable frame. The pressure expected to be gained by this was evidently very great, as the timbers of the frame were yellow pine 12 inches square and the toggle was geared very high. On the end of it was a plunger which carried a die the full size and shape of the finished wheel, acting against another die in the end of the frame. The wheel was to be made at one operation, and just here is where the scheme failed dismally. A wash heat was taken on the bloom and it was inserted in place, but when the press was put on the disk separated into about as many pieces as there were kinds of scrap in it, as might have been expected. The failure arose from using a scrap bloom, in the first instance, and from attempting to make a solid disk at one operation in the second, for the varying pressure in the convolutions disintegrated the mass at once, in spite of the wash heat. Had the bloom been put through several consecutive operations, working it into shape gradually, the result might have been a partial success, but there would have been incipient cracks through the disk from the impossibility of welding units of the scrap homogeneously.

In a recent lecture Professor Poynting pointed out that light presses with an almost infinitesimal force upon all objects which it strikes. Small as is this force it has recently been established to exist, and has been actually measured. It makes a wholly imperceptible addition to what we are accustomed to call atmospheric pressure. The first experimenter to hit upon this fact was Cleck Maxwell, who made the discovery some 30 years ago.

PERSONAL.

J. C. Bannister, superintendent of the plant of the Kewanee Boiler Company, Kewanee, Ill., has resigned his position with that company.

Linn, Bentley & Co. of Columbus, Ohio, pig iron merchants, announce that Mr. Fieser has retired and that the business will be conducted by them.

Frank J. Mulcahy, who has for several years been commissioner of the Soil Pipe Association, has taken charge of the sales department of the Eaton, Cole & Burnham Company, and he has also been given the official position of secretary, with offices at 253 Broadway, New York.

W. F. Klemp, formerly president of the Archer Iron Works, Chicago, has resigned his position and disposed of his stock in that company.

E. E. Forgeus, purchasing agent of the Pressed Steel Car Company, Pittsburgh, has resigned. Mr. Forgeus was given a complimentary dinner by officials and heads of departments of the concern and was presented with a handsome traveling clock and smoking set.

S. E. Smith, chief engineer of the Donora Works of the Carnegie Steel Company at Donora, Pa., has resigned, having been appointed chief engineer of the Passaic Steel Company, Paterson, N. J. Mr. Smith assisted largely in designing the Sharon and Donora Works of the Carnegie Steel Company.

W. E. Corey, president of the United States Steel Corporation, expects to sail for Europe on May 2.

H. C. Atkins, president of E. C. Atkins & Co., saw manufacturers, Indianapolis, Ind., has been elected president of the Manufacturers' Association of Indianapolis.

E. C. Lott, who has for some years been manager of plants in the Chicago district of the American Steel & Wire Company, including Waukegan, De Kalb and Joliet, in Illinois, and Anderson, in Indiana, has tendered his resignation in order to devote his time to large real estate interests. No successor has been announced as yet.

Charles A. G. Winther resigned as general superintendent of the Chapman Valve Mfg. Company at Indian Orchard, Mass., last Saturday, and on Friday night his colleagues and friends tendered him a complimentary farewell dinner at the Henking, Springfield, Mass. Mr. Winther has not as yet announced his future plans. He was general superintendent of the Chapman Company for four years.

William G. Coxe has been elected president of the Harlan & Hollingsworth Company, Wilmington, Del., a subsidiary interest of the Bethlehem Steel Corporation. Mr. Coxe succeeds Daniel C. Reid, resigned.

Andrew Carnegie has presented Norwich University with \$50,000, to be used in the erection of a laboratory building and the equipment of an electrical department.

Frederick Butler, who has been cashier for the Reading Iron Company, Reading, Pa., for 28 years, has been elected treasurer of that company as the successor of George B. Harris, resigned.

Announcement has been made of a number of changes in positions at the Homestead Steel Works and Donora Works of the Carnegie Steel Company, effective April 1. Harry J. Davis, who has been assistant superintendent at Homestead, has been appointed superintendent at Donora, while John S. Ugger, superintendent of the armor plate department at Homestead, becomes assistant superintendent. Charles Fritz, formerly superintendent of the relief fund of the Homestead Works, is made secretary to Superintendent Davis at Donora. S. S. Wales, superintendent of the electrical department of the Homestead Works, is promoted to superintendent of the armor plate department at Homestead. Charles A. Menk succeeds S. S. Wales in charge of the electrical department. F. O. Knight, a draftsman, goes to Donora as mechanical engineer, and Frederick Christianer of Homestead goes to Donora as superintendent of the blooming mill. A dinner was given at the Carnegie Hotel in Homestead last week in honor of Harry J. Davis. It was attended by many heads of departments and addresses were made on his change of position. He was presented with a costly hall clock by his fellow officials.

Pure Metallic Nickel for Coinage.

BY ALBERT LADD COLBY, NEW YORK.

The advantages of using pure metallic nickel for coins, instead of alloys of copper and nickel, such, for instance, as are now used in coining the United States 5-cent piece, known as our "nickel," may be briefly summarized as follows:

 Greater resistance of the nickel coin to wear, so that the imprint lasts much longer than with alloy coins.

Maintenance of their bright, attractive color and appearance, in comparison with the objectionable change of color occurring in time in alloy coins containing much copper.

 Increased scrap value of the pure nickel coins when finally taken out of circulation over the scrap value of an alloy coin.

4. Extreme difficulty in counterfeiting, as the more powerful presses and machinery necessary to make a nickel coin than required for an alloy coin render secrecy in counterfeiting pure nickel coins practically impossible.

5. To the above may be added the fact that if alloy counterfeiting was attempted on account of the advantages of lighter presses, the counterfeit coin could be at once detected from the pure nickel coin from the fact that it is not attracted by a magnet, as is the case with pure nickel.

Brief Review of the Use by Foreign Governments of Pure Nickel for Coins,

The above advantages of pure nickel for coins have been appreciated by a number of the foreign Governments.

The Swiss Confederation was the first country in the world to introduce pure nickel coinage. Their first issue of 20-centime coins bears the date of 1883. Up to the end of 1903, a period of 21 years, a total of 20,500,000 20-centime pieces had been coined.

In 1892 Austria-Hungary followed the example of Switzerland and put in circulation four pure nickel coins, in Austria a 10-heller coin and a 20-heller coin, and in Hungary a 10-filler coin and a 20-filler coin. Between 1892 and 1895 the Imperial Mint in Vienna, Austria, coined 168,000,000 pieces of 10-heller and 126,000,000 pieces of 20-heller coins. During this same period the Royal Hungarian Mint at Kremnitz coined 72,000,000 pieces of 10-filler and 54,000,000 pieces of 20-filler coins. This makes a total of 420,000,000 nickel coins struck off by Austria-Hungary from 1892 to 1895. Since 1895 these countries have issued no nickel coins.

Italy was the next country to adopt nickel for coinage by a bill passed on February 13, 1902, authorizing the Royal Mint to coin 120,000,000 25-centesimi pure nickel pieces. Acting on this authority the mint struck off some 12,000,000 pure nickel coins, but as the design was criticised on account of its similarity to the Italian silver lira, these coins have been practically withdrawn, and a coin of a new design will probably be issued, and it is possible that although it will be of the same size it may be given a different value than 25 centesimi.

In France the suggestion to use nickel for coinage was first made in 1881, by the then Minister of Finance, M. Magnin, who prepared a bill which, however, was not passed by the Chambre des Deputes. Several years after a similar bill was brought to the attention of the Chamber without result. In 1886 the matter was again referred to the French Government, who seemed favorable to passing a law authorizing pure nickel coinage, but the bill failed to actually pass the Chamber. In 1903, however, a bill was passed authorizing the issue of 10,000,000 pure nickel 25-centime pieces. In 1904 the French Mint issued a similar number of nickel coins of 25 centimes value, but of a somewhat different design than the 1903 issue.

The following table shows the sizes and weights of

the foreign pure nickel coins, and the required fineness in nickel of the coin blanks to be furnished to the mints:

					Mamper	
	Re	equired 1	Dlamete	r	of coins	
	fi	neness	of coin.	We	eight issued	
	li i	n nickel.	Milli-	of c	coin. to end	
Country.	Name of coin.	Per ct.	meters.	Gra	ams. of 1903.	
Switzerland	20 centimes	97.5	21.25	4	20,500,00	0
Austria	10 heller	97.0	19.00	3	168,000,000	0
Austria	20 heller	97.0	21.00	4	126,000,000	0
Hungary	10 filler	97.0	19.00	3	72,000,00	0
Hungary	20 filler	97.0	21.00	4	54,000,00	0
Italy	25 centesim	97.5	21.50	4	12,000,00	0
France	25 centimes	98.0	24.00	7	10,000,00	0

In 21 years (1883-1903) Switzerland has coined 20,-500,000 nickel 20-centime pieces, an average of 976,190 per annum.

In four years (1892-1895) Austria-Hungary struck off 420,000,000 pure nickel coins, an average of 105,000,000 per year.

In 1903 Italy coined 12,000,000 of 25-centesimi pieces. In 1903 France coined its 10,000,000 issue of 25-centime pieces, and a similar number in 1904.

Summarizing the above, the annual issue of nickel coins has been:

	C	Coins per annum.
Switzerland		976,190
Austria		105,000,000
Italy		12,000,000
France		10.000.000

The annual coinage by the United States Mint of 5cent pieces from an alloy of 75 per cent, copper and 25 per cent, nickel is as follows:

	years, the las										0 1	0 1								ot 3									per year. 15,977,543
141									0	0		0	0					0 1			0		0 1		 	0	0	0	26,029,031
	1900.						 										0		 		٠		0			0		0	27,255,995
	1901.			0	0	0	 					0				0 1	0		 		0			0 1	 				26,480,213
	1902.	0	0	0	0			 0	0		0	0						0	 	 		9				 			31,480,579
	1903.	0	0	0	0		 		0	0			0	0	0	0 1	0 1	0 1	 		0	0	0	0 0	 	0		٠	28,006,725

Labor Notes.

The Inland Steel Company, Chicago, informs us that it has reopened its sheet mill, closed since last July on account of labor differences, on the open shop basis, rather than nonunion as reported in these columns last week. The company states that it has more applications than positions for men, and anticipates no difficulty in continuous operation from now on.

In accordance with a notice posted at the different plants of the Thomas Iron Company several weeks ago, an advance of 10 per cent. in the wages of employees has been made, which went into effect April 1. The advance will be made at the company's Hokendauqua, Alburtis, Hellertown and Island Park furnaces, in the Lehigh Valley, Pa., as well as at the Richard Mine, in New Jersey, and other outlying operations.

The United States Steel Corporation made an important advance in wages of employees not on the tonnage basis, which went into effect on April 1. It is stated that the standard of wages will by this advance be brought near the level which was in force prior to the reduction made about a year ago. The statement is also made that the total increase in wages for the year will approximate \$9,000,000.

Drop in temperature of superheated steam in well lagged mains has been found by Dr. Berner of Berlin to be from 0.3 to 1 degree per foot of length, and varies inversely as the diameter of the pipe and the steam velocity. This loss is greater than is apt to be appreciated by those who are used only to saturated steam.

The Wells Brothers Company, Chicago and New York, has secured the contract for the building of the first section of the Free Technical School which Andrew Carnegie has planned to establish in Pittsburgh. The company's bid was \$499,700, and as there is to be at least \$4,000,000 expended on the buildings alone, this award covered only a very small part of the entire project.

Trade Publications.

Pumps.—Emerson Steam Pump Company, Prince street and Strand, Alexandria, Va. Annual illustrated catalogue, 37 pages, size 6 x 9 inches. Describes the Emerson steam pump, which is one of vertical pattern and of strikingly individual design, pronounced to be capable of satisfactory service under the most severe conditions. At the same time it claims economy in steam consumption and exceptional durability. A most unusual claim for the pump is that air admitted into the suction pipe, even in large quantities, will not stop it working. As the pump is one which has no rubbing surfaces in contact with the water, it is well able to handle gritty or sandy water. For this reason it is specially recommended for contractors' purposes, mining, quarrying and all outdoor pumping. The catalogue also describes a quick cleaning strainer and foot valve for attaching to the suction pipe. A circular inclosed gives a number of testimonial letters.

Technical Paints.—International Paint Works, Williamsport, Pa. Pamphiet. Subject, "Technical Paint for Gas Holders, Power Plants and Water Towers." Deals with protective paints for metals exposed to the weather.

Electrical Machinery.—National Electric Company, Milwaukee, Wis. Two cards. Give views of two 300-kw. National direct current engine type generators, as installed in the St. Louis Lead Company's plant, Bonne Terre, Mo.; a motor car with trailer operating on the high speed interurban lines of Birmingham, Ala., a system which uses the Christensen air brakes, and a view of the Christensen compressor, which forms part of the air brake equipment.

Universal Wood Saw.—Colburn Machine Tool Company, Franklin, Pa. Bulletin No. 17. Gives illustrations of the new Colburn saw table and samples of work done on the machine, many of which are quite intricate.

Air Compressors.—Christopher Murphy Company, 204 Dearborn street, Chicago, Iil. Catalogue A. Size 5¼ x 7½; pages 30. Describes the Fisher air compressors arranged in tandem with steam engine or gas or gasoline engines. The construction is described and shown diagrammatically in considerable detail. Numerous views are given of the various equipments. Complete tables of dimensions and capacities are appended and tables of useful information. The firm is also prepared to furnish reservoirs for compressed air in a large number of stock sizes which are listed.

Protective Paints.—Joseph Dixon Crucible Company, Jersey City, N. J. The April issue of *Graphite*, published by the Dixon Company, is an extra large edition, devoted exclusively to Dixon's silica graphite paint. It shows a number of structures in which it was used for the protection of steel and outdoor work generally.

Universal Pipe.—Central Foundry Company, 116 Nassau street. New York. Fac-simile letter from the general manager of the Knickerbocker Construction Company concerning a notable installation of universal pipe, in which the conditions were in many cases unusually adverse, and the difficulties would have been well nigh insurmountable, in the writer's opinion, if there had been any attempt to use other than universal cast iron pipe and fittings.

Drill Grinders.—Washburn shops of the Worcester Polytechnic Institute, Worcester, Mass. Catalogue C. Drill grinders. Contains illustrations and specifications of various sizes and styles of drill grinders, and some useful hints with regard to the selection of the proper tool for certain work, and the correct and incorrect ways of grinding drills. It also compares the process of wet and dry grinding.

Electric Motors.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Two circulars. No. 1097 deals with Westinghouse type K motors, direct current, series wound, for crane hoisting and similar service. It shows the parts of the motor and controlling apparatus and a number of diagrams giving the performance curves of the various types. No. 1099 deals with Westinghouse bi-polar motors, type R, for direct current circuits. These are motors of small power, ranging in sizes from 1-16 to 1% horse-power, wound for 110 and 220 volts.

Fan Motors.—Emerson Electric Mfg. Company, St. Louis, Mo. Two catalogues. No. 2875 concerns the Emerson alternating current fans as perfected to date. Numerous small halftones accompany a detailed description of construction, and others show the various forms in which the fan is made for desk or wall, or to hang from the ceiling or be mounted on a column. No. 2895 in a similar way describes the Trojan alternating fan motors, which are of a cheaper grade and made by the same company. Bulletin No. 3501 describes the Emerson exhaust fans, direct connected to alternating or direct current motors.

Testing Machinery.—Riehlé Brothers Machinery Company, Incorporated, 1424 North Ninth street, Philadelphia, Pa. Supplementary sheets to catalogue A. Describe calibrating levers, vertical screw power testing machines for compression, tension and transverse testing in various capacities, a torsional testing machine, torsion indicator and various accessories, such as specimen holders, compressometers, extensometers, &c.

Water Wheels.—The Fitz Water Wheel Company, Hanover, Pa. Catalogue of the I-X-L steel overshoot water wheel. Various illustrations show typical installations and the text gives useful information concerning the selection of water wheels, a comparison of their performance with that of turbine

and wood wheels, methods of taking various measurements, and details and rules involved in calculations in connection with water power. Another pamphlet contains a large number of testimonial letters concerning the work done by the I-X-L steel overshoot water wheel.

Windmills.—Aermoter Company, Chicago, Ill. Illustrated catalogue. Size 4½ x 8 inches, pages 72. An interesting historical account of the development of the windmill is given in the forepart of the catalogue, leading up to the present forms made by this company. The selection of the parts and the installing of the windmill equipment is interestingly described and is followed by an explanation of the various mechanical details in the aermoters. Tanks and pumps for use in water supplying by wind power, and farm machines that may be similarly driven, such as grinders, saws, feeders, shellers, &c., occupy the latter part of the catalogue.

Roller Car Bearings.—Hyatt Roller Bearing Company, Harrisburg, N. J. Bulletin No. 117 gives dimensions, capacity and price-list of standard Hyatt roller car bearings, as adapted to shop cars, trucks, trains, trolleys, tumbling barrels and all work involving heavy duty at slow speed.

Wood Working Tools.—Fox Machine Company, Grand Rapids, Mich. Two catalogues. One is addressed particularly to pattern shops and the other to users of wood working tools in general. These catalogues list, illustrate and describe a very complete line of wood working tools.

Wire Connectors.—Holtzer-Cabot Electric Company, Boston (Rrookline), Mass. Bulletin No. 208. Concerns the improved Lillie wire connectors, styles A and B, for joining telegraph and telephone wires without the use of solder.

Cold Saws.—Higley Machine Company, New York City. Catalogue No. 3. Pages 47, size 6 x 9 inches. Gives a complete account of the features of the Higley cold saws and machines for grinding saws. Illustrates the numerous patterns and sizes in which they are made, each illustration being accompanied with a brief statement of the character of work for which they are particularly adapted. Two particularly interesting views show full size engravings of round machinery steel 4 inches in diameter, as cut with a rapid cut and with a slower cut, showing the different conditions in which two rates of sawing leave the metal. A feature emphasized in the text is the drive of the saw, which is applied through the blade itself by a sprocket engaging notches cut near the periphery of the saw disk, thus removing all tendency to buckle the blade in rapid cutting. Among the several styles of saw shown are those adapted to general shop work, light and heavy grades, to the sawing of steel castings, structural shapes and portable rail saws. Saw grinders are also shown in several forms for hand or power operation.

Gas Producers and Gas Engines.—Weber Gas & Gasoline Engine Company, Kansas City, Mo. Catalogue No. 21. Size 7% x 11 inches. Pages 20. Pertains to multiple cylinder vertical engines and the Weber suction gas producer. The text treats interestingly of the losses in a steam plant as compared with those in a gas plant, and gives an instructive dissertation on producer power gas plants, with particular reference to the Weber suction gas producer, with items of information as to the expenses attending the operation. Double and triple cylinder vertical gas engines of Weber type are shown in half-tone, and line engravings are given of typical installations. Useful information is appended and specification tables of dimensions of gasoline engines, geared hoisting engines and geared pumping outfits are given. Inclosed with the catalogue are fac-simile testimonial letters and a circular on the manufacture of charcoal in kilns.

Electric Pumps.—Allentown Rolling Mills, Allentown, Pa. Catalogue No. 7. Illustrated. Deals with the Aldrich electric pumps and its general characteristics in considerable detail, making use of numerous small sectional engravings. The pumps are made in triplex and quintuplex patterns, the first being intended for lifts of 300 feet or under and the second for lifts of over that hight. The drive is offered in three standard forms—by gears, chain and belt connection—and arrangements are made in some cases for variable speed. The half-tone illustrations show different equipments for various classes of service, ranging from large capacity and low lift to heavy lift and small capacity. Tables for each pattern give specifications of sizes and capacities of each lift. Vertical triplex sinking pumps and portable pumps are among the special types shown. Useful information bearing on hydraulic work is contained in the back. A loose circular designated as "Pump Data No. 8" refers to ground pump plungers and the advantages resulting from grinding.

The temporary receivers appointed by the courts to take charge of the affairs of the Newton Fire Brick Company, Albany, N. Y., have been removed and the business has reverted to the company, which has been reorganized with W. G. Rice as president; C. B. Flint, treasurer and general manager; F. W. Kelly, secretary, and C. H. Sabin, vice-president. The company is making extensive additions to its plant and during the past eight months its business has increased 20 per cent. It is aiming to increase the locomotive material branch of its business and will add to the manufacture of its other lines.

The Jackson Iron & Tin Plate Company Plant Sold.

The sheet and tin plate plant of this company, located at Clarksburg, W. Va., was sold on Monday to J. R. Phillips, resident manager in the Pittsburgh district of the American Sheet & Tin Plate Company. Associated with Mr. Phillips in the purchase are a number of Pittsburgh bankers and also E. T. Weir, now manager of the Monessen plant of the American Sheet & Tin Plate Company, at Monessen, Pa. It is the intention of the purchaser to remove the entire plant from Clarksburg to some other place, probably in the Pittsburgh district, in order to be near the source of supplies of raw material.

The plant contains three sheet and five tin mills and a bar mill. Only part of the plant has been operated and this for a short time. It is the intention to form a new company to operate the plant after it has been moved to the new location. J. R. Phillips will be president and E. T. Weir manager of the works. This plant cost originally about \$400,000 or more, but the new owners secured it for less than one-half that sum. The plant is a strictly modern one, all the equipment being practically new and of the latest design. Both Mr. Phillips and Mr. Weir have severed their connection with the American Sheet & Tin Plate Company in order to give their entire time to the new enterprise.

The number of new companies incorporated in the Eastern States during March, 1905, was larger and the amount involved exceeded that of any month since October last, when the companies incorporated with a capital of \$1,000,000 or more had a total capital of \$215,-500,000, as compared to \$192,645,000, which was the figure attained in February. New Jersey registered more companies than any other State, the capital stock of the companies incorporated in that State reaching \$131,250,-000, while New York City only records \$13,500,000. The incorporation of enterprises with a capital of \$100,000 or more but less than \$1,000,000 was also large. The total of the capital stock of such concerns was swelled to over \$43,000,000, which exceeds the record of several months previous. The records show a growth in realty and construction concerns. The figures quoted are for authorized capital.

The details of the plans for merging the Southern iron properties are being worked out satisfactorily, and an announcement of the completion of the deal can be looked for almost any day. According to the present plans the consolidation will include the Southern interests of the Republic Iron & Steel Company and all the properties of the Sloss-Sheffield Steel & Iron Company, Tennessee Coal, Iron & Railroad Company and the Alabama Consolidated Coal & Iron Company.

At Altoona, Pa., on April 4, the committee of the Central Pennsylvania Coal Operators appointed at the Philadelphia meeting the previous Saturday met the Miners' Scale Committee and signed the old scale for another year, and averted a strike. The operators do not believe that the conditions warrant the scale, but they are willing to try it. Skilled men will receive from \$2.28 to \$2.75 a day, and laborers from \$1.85 to \$2.08.

A historic piece of machinery was among that recently taken from the dismantled plant of the Republic Iron & Steel Works at Frankton, Ind. It was a 500-horse-power engine taken from a gunboat sunk during the blockade of Vicksburg. At the time of the engine's removal it had been under water twelve years. A salvage company sold it to the founder of the mills at Frankton, where it furnished the power for the large rolls. It has been shipped to one of the Chicago factories and is still in good order.

NEWS OF THE WORKS.

Iron and Steel.

At the annual meeting of the Warwick Iron & Steel Company, Pottstown, Pa., the following officers were re-elected: Edgar S. Cook, president and general manager; Wm. S. Pilling, vice-president; G. W. Nichols, secretary.

The Chattanooga Blast Furnace Company has authorized the expenditure of \$100,000 on its Chattanooga furnace. The furnace will be completely rebuilt, and contracts for putting it in condition will be given out shortly. The organization of the company has been effected with the following officers: C. E. Buck, head of the Lacey-Buck Iron Works. Birmingham, Ala., president: William Yule of St. Louis, vice-president; F. V. Berry of Birmingham, Ala., secretary. The directors are C. E. Buck, F. V. Berry, William Yule and S. M. Chambliss, the latter of Chattanooga.

The Crumwold Furnace of the Reading Iron & Steel Company, Reading, Pa., is out of blast for repairs.

The Elwood (Ind.) plant of the American Tin Plate Company, the largest plant in the country, is running day and night at full capacity. It is estimated that \$1,000,000 of the finished product will be in the warehouses by June 1.

The La Follette Furnace, La Follette, Tenn., is out of blast for repairs.

Lebanon Valley Furnace, Lebanon, Pa., is out of blast undergoing repairs.

Franklin Furnace of the Franklin Iron Mfg. Company, Clinton, N. Y., was blown in on April 1.

The Dunbar Furnace of the Dunbar Furnace Company, Dunbar, Pa., was blown out March 30. It will be again in blast in about three weeks.

The Carnegie Steel Company is removing part of the equipment of the Girard plant, at Girard. Ohio, to the Greenville works, at Greenville, Pa. The Girard plant is not running, but the Carnegie Steel Company expects to start up the Greenville works this week. The plant will be run on a nonunion basis and Amalgamated scale wages will be paid except for puddling, for which a higher rate is to be paid. J. E. McKay, who will be superintendent of the Greenville plant, has made the following announcement: "The Carnegie Steel Company is ready to receive applications for work in the Greenville mills. The Amalgamated scale will be paid for all iron workers. All former employees will be given preference, and may have their old jobs by applying before March 31. Places vacant at that date will be filled with out of town men. The Carnegie relief fund will apply to all employees of these mills."

The plant of the Morgantown Tin Plate Company, at Morgantown, W. Va., has again been sold in the United States Court to George C. Sturgiss of Morgantown for \$200,200. The plant was sold recently at a lower price and the courts declared the sale illegal and ordered the property resold. It is reported that Mr. Sturgiss represents the United States Steel Corporation in the purchase of the Morgantown plant and that the works will be considerably enlarged.

Julian Kennedy. Bessemer Building, Pittsburgh, chief engineer of the Latrobe Steel Company, at Latrobe, Pa., is making plans for the enlargement of the Latrobe works, which will about double the capacity. It is the intention to add two more tire mills, making four in all; install a 15-ton and a 4-ton steam hammer in the hammer shop, build two 30-ton open hearth furnaces, install several electric traveling cranes and a steam power plant of large capacity. The present output of the works aggregates 40,000 tons of ingots annually, and the new improvements will nearly double the output.

No. 1 blast furnace of the Carnegie Steel Company, at Donora, Pa., recently turned out 620 tons of pig iron in 24 hours. At present eight of the twelve 50-ton open hearth furnaces at this plant are in operation, and the other four will be started in a short time. Some excellent records for output are being made on the blooming mill at this plant.

General Machinery.

The Crescent Forgings Company, recently organized at Pittsburgh by Reuben Miller, Jr., David Dunlevy and others, has about placed contracts for all its buildings and equipment. The contract for the engines was given to Henry R. Cornelius, Frick Building, Pittsburgh, who represents the Brown Corliss Engine Company, Corliss, Wis., and calls for two 11 and 10 x 10 inch cross compound engines. Cahali water tube boilers will be installed in the plant. Robert A. Bole, Park Building, Pittsburgh, representing Manning, Maxwell & Moore, was given a contract for two 10-ton cranes, each of 50-foot span, together with seven Chambersburg steam drop hammers, ranging from 700 to 6000 pounds.

The Allis-Chalmers Company has received an order from Jardine, Mathison & Co., one of the great British Oriental trading firms, for the complete equipment of a 500-barrel flour mill to be erected at Shanghai, China, by a native firm which already has in operation two small mills containing machinery of English manufacture. The company also shipped recently

from its Milwaukee works to Knox, Schlapp & Co., Melbourne. Australia, three of its latest improved universal bolters with vibromotor drive, to be used in a 300-barrel mill. These orders would indicate that Great Britain is losing to manufacturers of the United States business which it formerly controlled almost exclusively.

George Allen, who recently purchased the plant of the Sterling Machine Works, Sterling, Ill., will shortly incorporate the business and enlarge its manufacturing facilities. This purchase also includes the taking over of the Empire Lubricator Company, which was organized early this year for the purpose of manufacturing lubricators for traction engines.

An execution for \$30,983 has been issued against the Mellert Foundry & Machine Company, Reading, Pa., which is said to be one of the oldest industries in that city. It is stated that the sheriff will levy on the property and sell it.

The Longmead Iron Company, Conshohocken, Pa., is building a new machine shop in which will be concentrated the several smaller scattered machine shops now operated by the company. The tools from the smaller shops will be sufficient to equip the new building, and the company will not require any additional machinery.

The firm of Williams & Cosby, New Bern, N. C., has been dissolved by mutual consent, I. L. Cosby having sold his interest to W. A. McIntosh, who will continue the business under the name of the New Bern Iron Works.

The E. F. Reece Company, Greenville, Mass., manufacturer of taps, dies, screw plates, screw cutting machinery and tools, is installing the necessary equipment to operate its plant by electricity.

The Stroh-Morris Machine & Foundry Company's plant at Charleston, W. Va., which was recently destroyed by fire, is to be rebuilt. The loss amounted to \$12,000.

The newspaper reports of the erection of a large machine shop at Rockwood, Pa., by the Baltimore & Ohio Railroad are greatly exaggerated. The only improvement to be made at that point is the erection of a small engine house and machine shop, which will cost about \$6000.

E. H. Mumford and C. S. Lovell, formerly of the Tabor Mfg. Company, have formed the E. H. Mumford Company, for the manufacture of foundry molding machinery of all descriptions. The new enterprise is located at the southeast corner of Seventeenth and Callowhill streets, Philadelphia, Pa. It is the intention of the organizers of this company to make use of their long experience in the manufacture of molding machines to develop a line which will aim especially at simplicity, strength and efficiency. The latest and best combinations and modifications will be employed, which are amply protected by new patents. It may be expected under these conditions that the devices thus produced will have distinctive merits and advantages.

The Mexican Light & Power Company has awarded a contract for a construction plant to the General Electric Company, Schenectady, N. Y., to be erected during the summer at Rio de Janeiro, Brazil, where the Mexican Company has a large contract with the Rio de Janeiro Tramway, Light & Power Company to construct a machine shop and about 200 miles of railway.

Power Plant Equipment.

L. G. Rothschild, Indianapolls, Ind., has been appointed receiver of the Alfree Engine Company on complaint of A. G. Alfree, who has a claim against the company of \$25,000. The plant is estimated to be worth about \$100,000.

The General Electric Company has purchased land adjacent to its River Works, Lynn, Mass., and the fact has given rise to the published statement that this plant will be considerably increased immediately. General Manager W. C. Fish states that it is premature to speak of extensions at this time.

Dravo, Doyle & Co., merchant engineers, Lewis Block, Pittsburgh, report sales of Ball engines in March as follows: Fort Pitt Hotel, Pittsburgh, three 135 horse-power; Iroquois Apartments, Pittsburgh, three 120 horse-power; American Sheet & Tin Plate Company, Bridgeport, Ohio, one 250 horse-power: Lancconing Light & Power Company, Lancconing, Md., one 175 horse-power; Corrigan, McKinney & Co., Cleveland, Ohio, one 175 horse-power; McKinney Mfg. Company, Allegheny, Pa., one 450 horse-power; Page Woven Wire Fence Company, Monessen, Pa., one 400 horse-power., and Pennsylvania Power Company, Ellwood City, Pa., one 500 horse-power. Among recent sales in De Laval turbine machinery by this firm is the plant of the Indiana Cold Storage Company, Indiana, Pa., which will consist of two 200-kw. alternators, with two independent 10-kw. exciters. They are also installing a De Laval steam turbine, direct connected to a centrifugal pump, with a capacity of 8,000,000 gallons per day, at the plant of the Jones & Laughlin Steel Company. They also report numerous sales of Cochrane heaters.

Bridges and Buildings.

Kahmann & McMurry, Kansas City, Mo., have been awarded contract for the erection of the substructure of a \$100,000 bridge across the Sabine River on the Jasper & Eastern Railread.

U. Bibb Mills has been appointed receiver for the iron and

construction firm of Godfrey & Slack, Baltimore, Md. The receiver was asked for upon the complaint of Walter D. Godfrey, a member of the firm, who alleges in his bill that his partner has left the concern and he did not have sufficient capital to continue the business.

The County Commissioners at Springfield, Mass., have asked for bids for the superstructure of the new bridge over the Connecticut River, between Chicopee and West Springfield. The specifications cover seven spans of riveted steel superstructure, each about 170 feet in length, and two short spans. The total length of the structure is to be about 1250 feet.

Foundries.

The Weir Stove Company, Taunton, Mass., is to build an addition to its molding shop to accommodate 15 to 20 more molders, and a building to increase the company's capacity for mounting and storing castings.

The Globe Iron Foundry Company, Johnstown, Pa., is making a number of improvements to its plant and is installing a new 40 horse-power Westinghouse motor, one No. 9 Sturtevant blower and one No. 12 Colliau cupoia. Contracts for all the work have been let.

The Pensacola Iron Works & Supply Company, Pensacola. Fla., succeeded to the business of James Hughes in November last, and was incorporated under the State laws of Florida in January. The president is W. B. Wright; vice-president, G. Eitzen; treasurer, W. De C. Kessler; secretary, H. L. Brosnahann, and general manager, Phil Wettman. The company makes boilers, tanks, all kinds of sheet iron work and castings, having as its territory the States of Florida, Georgia, Alabama and Mississippi.

Fires.

The National Refining Company's plant in Cleveland. Ohio, was burned April 1, the loss being estimated at \$250,000. The flames spread to the Brook Refining Company's works, which were damaged about \$20,000.

The punch, machine and blacksmith shops of the Union Dry Dock Company, Buffalo, N. Y., were partly destroyed by fire on November 30. The loss is about \$75,000.

The plant of the Machinery Forging Company, Joliet, Ill., was destroyed by fire last week. The loss will amount to about \$10,000.

The plant of the Carter & Hakes Machine Company, Winsted, Conn., builder of machine tools, was partly destroyed by fire March 29. The loss is estimated at \$14,000 and is covered by insurance.

The car repair shop of the Public Service Corporation at Camden, N. J., was recently burned. The loss is said to be about \$35,000.

The plant of the Atlantic Stamping Company, Rochester, N. Y., was recently damaged \$90,000 by fire. One floor of the building was occupied by the Union Foundry & Machine Company, whose loss is said to be total. The Stamping Company is building a new plant, which it expects to occupy May 1.

The plant of the Buffalo Tin Company, Buffalo, N. Y., was damaged \$40,000 by fire on March 27.

The plants of the G. E. Thing Company and the Peerless Belting Company, at Buffalo, N. Y., were damaged \$200,000 by fire on April 1.

Hardware.

Covert Fire Escape Company, Troy, N. Y., has been organized to manufacture the new fire escape patented by James C. Covert. The officers of the company are James C. Covert, president; James H. Caldwell, vice-president; Julius S. Hawley, treasurer, and Albert E. Davis, secretary and general manager. Mr. Covert is also president of the Covert Mfg. Company. Mr. Davis has for the past 15 years been manager of the sales department of the same company. The new company has purchased a plant on Green Island, which is on the west side of the Hudson River, opposite Troy, and is equipping the plant with the necessary machinery for the manufacture of the fire escape.

The British Columbia Wire & Nail Company, Limited, Vancouver, B. C., has just purchased 20 nail machines to make ½ to 6 inch nails; also a drawing bench, the latter having been purchased from the Bates Machine Company, Joliet, Ill. The firm also bought a machine shop outfit and a staple machine. It has just concluded the purchase of water front property in Vancouver, which also has railroad facilities, and is now erecting large buildings for its shops. Its capacity for nails will range from 10 to 20 tons a day.

Miscellaneous.

The American Rodless Endgate & Mfg. Company is a new concern incorporated at Indianapolis with \$50,000 capital stock by Wm. F. Wagner, Henry and O. F. Brookmeyer.

The Barber Mfg. Company, Anderson, Ind., has increased its capital stock to \$100,000 in order to provide for the enlargement of its plant. It manufactures bed springs.

The Commercial Club of Alexandria, Ind., has contracted with Kiefer Bros. of Gas City for the removal of their plant,

which manufactures molds for glassware. Forty skilled men are employed.

F. W. Bailweg and William Blizzard, president and vicepresident of Ballweg & Co., box manufacturers. Indianapolis, Ind., have purchased for \$25,000 the box plant of the Fred L. Dietz Company of the same city.

The American Arc Lamp Company, successor to the Lea Electric Mfg. Company, Elwood, Ind., has been organized at Indianapolis and is erecting buildings at Kalamazoo, Mich., to which the Elwood plant will be removed.

A charter has been issued to the Mt. Laurel Slag Company, Reading, Pa., which has a capital of \$50,000, and which will manufacture various products from slag.

The Beaton & Corbin Mfg. Company, Southington. Conn. will build an addition to its plant, to be two stories and 30 x 50 feet. The lower floor will be used for a packing and shipping room and the second story for a storeroom. The company manufactures ceiling and floor plates, pipe hangers and other steam fitters' specialties.

The Bon Air Coal & Iron Company, Bon Air, Tenn., which now has 150 coke ovens at its Eastland plant, will add 50 more during the summer, making a double battery of 200 ovens.

The Motor Car Specialty Company, Trenton, N. J., has incorporated for the manufacture of automobile wheels, speedometers and accessories. The company is installing a plant at Lamberton and Lalor streets, most of the equipment for which has been purchased.

The Ettrick Mills, Auburn, Mass. manufacturer of carpets. will quadruple its capacity by the erection of a building with a frontage of 196 feet and two wings running back 250 feet, and an extension to the spinning mill, 40×60 feet.

The William H. Armstrong Company, Somerville, Mass., Is repairing the damage done to its plant by the recent fire, and as none of the machinery was burned the company will not require any new mechanical equipment.

The Garlock Packing Company, Palmyra, N. Y., which has for many years manufactured Garlock ring and spiral packing for high and low pressure steam, has changed from a copartnership to a corporation, with a capital stock of \$1,000,000. The owners are O. J. Garlock, E. R. Nicols and F. W. Griffith.

R. B. Seidel, Incorporated, Philadelphia Black Lead Crucible Works, 1324 to 1334 Callowhill street, Philadelphia, has purchased property, 20 x 150 feet, adjoining the present plant. The addition is three stories high and will be used partly as an office and for storage and shipping purposes. The acquired property will also give the company increased storage room for finished crucibles, allowing longer seasoning before shipment of goods, as well as to meet the increasing demands of the business.

The Pittsburgh Stoker & Mfg. Company.-This corporation, formed recently for the manufacture of the Pittsburgh underfeed stoker, has had its plant in partial operation since January 1, and expects to be in full operation about April 15. The company, which is capitalized at \$150,000, has its works on Liberty avenue, Pittsburgh, and will build, in addition to stokers, blowers and heating and ventilating apparatus for hot blast indirect heating. The Pittsburgh stoker is built on the underfeed principle, with improved devices for handling coal, with a patented combined tuyere and grate bar, eliminating the old dead plates now in use. The company has a number of orders on its books and has installed the stoker in the following manufacturing plants in the Pittsburgh district: McKees Rocks plant of the Pressed Steel Car Company, Mc-Cutcheon mills of the Carnegie Steel Company, Union Switch & Signal Company's works and in the works of several other concerns. The stoker is also in use in the Diamond National Bank Building and the Oil Well Supply Company's Building. The officers of the company are W. C. McCance, president; L. T. Brown, vice-president; H. C. Schwable, secretary; William A. Zahn, treasurer; J. M. Searles, general manager; D. K. Bartlett, superintendent of works, and H. P. Curtis, manager of blower department.

The Reese-Hammond Fire Brick Company, Bolivar, Pa., which went into the hands of receivers some months ago, will be turned over to the original owners within a short time, arrangements having been made with the creditors to that effect. The company is said to have on its books a large number of orders for fire brick and expects to soon take its place again among the leading manufacturers of fire brick in this country.

Accident Emergencies in Shops.

First aid to the injured is receiving more attention than formerly in manufacturing establishments, but a large percentage of shops and factories are just where they used to be, dependent upon the hurried call for a surgeon when the emergency arises. Considered both from the philanthropic and financial points of view it is a wise precaution to prepare in advance for the moment when an accident shall occur. Ouick and intelligent treatment of an injury will oftentimes prevent serious, perhaps fatal, results. Surgeons are not always on call and ambulance service, if it be available, may mean the covering of considerable distance and consequent loss of precious time. Delay may necessarily occur before skilled professional services can be obtained. The gap may be bridged by the proper care of the victim and this without the exercise of more than superficial skill.

Most shops and factories have one or more men, foremen or workmen, with a natural aptitude for this sort of thing, who are recognized by their fellows as being more skilled than they and are trusted by them in consequence. Such men, unless properly instructed, have ideas of surgery very much at variance with accepted practice. Theirs is the sort of surgery that advises the dipping of the amputated finger stump into a bath of shellac, the long accepted treatment of the shop, and the results are usually shocking scars and sometimes blood poisoning. The alcohol in the shellac has a virtue, but this is all that is good of a barbaric treatment. Other shop remedies are equally primitive. But let the "shop doctor" be given a course in first aid to the injured and he is usually quick to discard his old notions and become a useful individual in time of emergency. Many manufacturers have recognized the importance of this precaution.

Some large establishments have regularly employed surgeons, who are supposed to be always within call and who have as an important duty the instruction of employees in first aid to the injured. They are taught how to bandage, how to check the flow of blood, the correct use of stimulants and the treatment of minor injuries, such as superficial cuts and burns and bruises. Bandages, antiseptics, &c., are kept at hand ready for immediate use. In smaller establishments, where no surgeon could be regularly employed, the same training can be given to the workman or foreman. It is not an expensive matter. On the other hand, the gain may be material. In legal actions on the part of employees to recover for injuries received in the works, where the employer is liable, timely emergency treatment may materially affect the award of damages. The superficial injury, properly attended to, will heal much more quickly than under crude remedies and treatment, and the workman will be back on his job, or, if he has not been compelled to lay off, will be restored to his fullest efficiency much sooner, which in the case of a skilled man means a saving in dollars and cents. In all cases the humane element is carried out. Taken all in all, it is difficult to see where an employer can lose anything in making provision for emergencies in his works, and it is just as easy to see where he will be a substantial gainer in the long run.

The Blue Mountain Iron & Steel Company.-Jacob Rohrbach and Charles C. Waters of Frederick and L. B. Keene Clagett of Baltimore, Md., have been elected trustees of the bankrupt Blue Mountain Iron & Steel Company, Philadelphia, Pa. The election occurred after a hearing before Major E. Y. Goldsborough, referee in bankruptcy for Frederick and Montgomery counties, at which over 220 claims, aggregating over \$600,000, were represented. Roy A. Rainey of New York, brother and heir of the late William T. Rainey of that city, is the principal creditor. William T. Rainey held \$317,000 worth of the bonds of the Blue Mountain Iron & Steel Company, besides the company's note for \$88,000. on which interest has accumulated to the amount of \$17,000. Besides the bonds mentioned, bonds to the value of \$187,-000 are held by other parties in New York and elsewhere, The Western Maryland and Monocacy Valley railroads

are among the creditors of the bankrupt company, having large claims for freight. There are also large claims for machinery, supplies, &c., the Frick Company, Waynesboro, Pa., being among the creditors of this class, and numerous claims for labor. The election of trustees is expected to lead to a final winding up of the affairs of the company, which during its existence of about five years has been almost constantly in court. The company owned the old Catoctin Furnace property in Frederick County, Md. The trustees will immediately proceed to have an appraisement of the property made and will then ask for an order of sale.

A Large Coal Land Purchase.—The larger steel and iron manufacturers, who have been in the market for some time buying available acreage of coal lands, are pursuing a policy which was inaugurated by the United States Steel Corporation upon its organization to provide against any future contingencies and necessities of its business, and are rapidly acquiring control of the new territory in Washington and Greene counties of Pennsylvania, the product of which has proved for their purposes equal to that of the original Connellsville field. The latest sale recorded and affirmed is the largest single sale of coal lands ever made in southwestern Pennsylvania territory. The purchaser is the Vesta Coal company, a subsidiary company of the Jones & Laughlin Steel Company, Pittsburgh. The tract which has been sold was owned by J. V. Thompson, James R. and Joseph E. Barnes and I. W. Seamans of Uniontown, and consists of 9600 acres. The purchase price was a little in excess of \$3,000,000. The tract fronts a mile on the Monongahela River, near Brownsville, and also has a frontage of about five miles on the old National pike from Centreville to Hillsboro. It adjoins other tracts of the Jones & Laughlin Steel Company, the Ellsworth Coal Company, the Pittsburgh-Buffalo Company and the Clyde Coal Company. It comprises 150 separate tracts, including the coal under most of Deemston, Centreville and West Bethlehem townships, Washington County.

The Lukens Iron & Steel Company, Coatesville, Pa., on March 29, entertained a party of 25 students, accompanied by Prof. H. Wade Hibberd of the Department of Railroad Engineering, Sibley College of Cornell University. After inspecting the various departments of the plant the visitors were given a luncheon at the Hotel Speakman. Horace B. Spackman and W. H. S. Bateman had charge of the arrangements, and were assisted by A. F. Huston, president, and other officials of the company in conducting the guests about the plant.

According to the official records of the Bureau of Navigation of the Department of Commerce and Labor, the tonnage of vessels built by the lake shipyards during March was 14,441. while the total of all the rest of the country amounted to 13,079. The largest ship built in the United States during March was the James P. Walsh, at the Craig Shipbuilding Company's Works, Toledo. The Walsh is a steam vessel of 5630 tons. The next largest ship constructed in the country was the Providence, built at Quincy, Mass., for the Old Colony Steamboat Company. During the quarter ended March 31 the tonnage of vessels built in the country was 62,744, as compared with 55,066 tons in the corresponding quarter of 1904.

The Cambria Steel Company, Johnstown, Pa., has received an order from the Pennsylvania Railroad for 500 steel cars and an order from the Western Maryland Railroad for the same number. The Cambria Steel Company has other large orders on its books for steel cars and intends to very much enlarge its plant for making steel cars.

A meeting of the stockholders of the Youngstown Iron, Sheet & Tube Company of Youngstown, Ohio, will be held on May 1, to take action upon the matter of changing the present name to that of "The Youngstown Sheet & Tube Company."

The Iron and Metal Trades

The tonnage booked by the Steel companies throughout the country is enormous, the total of the United States Steel Corporation being now the largest on record. In some branches the congestion is such that an effort has been made to purchase material in the open market. It is reported that the Steel Corporation has endeavored to buy 50,000 tons from outside Plate makers without success.

The market is pretty bare of Pig Iron for Steel making. During the week the Steel Corporation purchased 22,000 tons of Bessemer Pig for April shipment from the Bessemer Association at \$15.50, Valley furnace, the old price, no advance being conceded. Through a leading firm of merchants 9000 tons were bought in the Hocking Valley at \$15.40, a slight concession, due to the fact that Bessemer Ore was in stock. Another outside interest sold about 4000 tons at the same price. Other Steel companies have taken additional quantities.

The total amount of foreign Bessemer Pig bought by a tidewater works was 30,000 tons, which covers sales of Rails made to South America. It is not believed probable, however, that much additional export Rail tonnage will be taken, because the pressure for Steel for home purposes is so very heavy.

Eastern Pipe makers have bought some round lots of Gray Forge Pig Iron and are in the market for more. The Pipe shops have been exceedingly busy for some time past. Some good orders have been secured, among them one lot of 8400 tons in Chicago, and additional inquiries are in the market. The striking feature of the industry, however, is that the spring demand has just set in in the form of a large volume of small orders.

The general foundry trade has not been in the market heavily for some time, and does not seem to be under any pressure of work. Still quite a large amount of Pig Iron was taken in the Philadelphia district during the past week, and some good business is under negotiation.

Reports from the Structural trade are encouraging. The leading interest has about 600,000 tons on the books, and specifications are coming in more freely. During March the American Bridge Company entered 50,000 tons. Among the work placed recently are 20,000 tons for the new plants of the Tube Company at McKeesport, 8000 tons for a building in Chicago, 4000 tons for track elevation for the New York Central road, and quite a number of manufacturing buildings. Locally there is a good deal of business in sight, including about 10,000 tons for the Altman Building. Other contracts will double this quantity.

Our Chicago correspondent notes that in some branches consumers have booked so heavily for their requirements with leading makers at lower prices that independent mills find it difficult to secure customers, and in some instances must meet the competition of resales. On the other hand, the largest producers are somewhat nervous over the volume of business offering and fear that importations on an uncomfortable scale may become necessary later on.

Production is going on at a tremendous rate, and the breaking of past records of output by individual mills and furnaces is a notably frequent occurrence.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Apr. 5.	Mar. 29.	Mar. 8,	Apr. 6.
PIG 1RON:	1905.	1905.	1905.	1904.
Foundry Pig No. 2. Standard,				
Philadelphia	\$17.50	\$17.50	\$17.50	\$15.00
Foundry Pig No. 2, Southern,				
Cincinnati		16.25	16.25	12.50
Foundry Pig No. 2, Local, Chicago	17.25	17.25	17.25	14.00
Bessemer Pig, Pittsburgh	16.35	16.35	16.35	14.35
Gray Forge, Pittsburgh		16.00	16.00	13.25
Lake Superior Charcoai, Chicago	18.50	18.50	18.50	15.25
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	24.00	24.00	24.00	23.00
Steel Forging Billets, Pittsburgh	27.00	27.00	26.00	
Steel Billets, Philadelphia	28.00	28.00	28.00	25.50
Steel Billets, Chicago	28.00	28.00	28.00	24.00
Wire Rods, Pittsburgh	34.00	34.00	31.50	31.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	15.25	15.00	14.50	11.50
O. Steel Rails, Philadelphia	18.00	18.00	18.00	15.00
O. Iron Rails, Chicago	,20,00	20.00	19.50	16.50
O. Iron Rails, Philadelphia	25.00	25.00	23.00	18.50
O. Car Wheels, Chicago	16.00	16.00	15.75	14.00
O. Car Wheels, Philadelphia	17.00	17.00	16.00	13.50
Heavy Steel Scrap, Pittsburgh	16.00	16.00	16.00	14.00
Heavy Steel Scrap, Chicago	14.75	14.75	14.50	11.50
FINISHED IRON AND STEED	La			
Refined Iron Bars, Philadelphia.	1.734	1.731/	1.67%	1.481/2
Common Iron Bars, Chicago	1.60	1.624	1.60	1.50

Refined Iron Bars, Philadelphia.	1.731/2	1.731/2	1.671/2	1.481/2	
Common Iron Bars, Chicago	1.60	1.621/2	1.60	1.50	
Common Iron Bars, Pittsburgh	1.65	1.65	1.65	1.40	
Steel Bars, Tidewater	1.641/2	1.641/2	1.641/2	1.491/2	
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.35	
Tank Plates, Tidewater	1.741/2	1.741/2	1.74%	1.74%	
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60	
Beams, Tidewater	1.741/2	1.741/2	1.741/2	1.7416	
Beams, Pittsburgh	1.60	1.60	1.60	1.60	
Angles, Tidewater	1.741/2	1.741/2	1.741/2	1.741/2	
Angles, Pittsburgh	1.60	1.60	1.60	1.60	
Skelp, Grooved Steel, Pittsburgh	1.65	1.65	1.65	1.45	
Skelp, Sheared Steel, Pittsburgh.	1.70	1.70	1.70	1.521/2	
Sheets, No 27, Pittsburgh	2.30	2.30	2.20	2.15	
Barb Wire. Pittsburgh	2.25	2.25	2.25	2.50	
Wire Nails, Pittsburgh	1.80	1.80	1.80	1.90	
Cut Nails, Pittsburgh	1.80	1.80	1.80	1.75	

METALS:

Copper, New York	15.25	15.25	15.25	13.121/2
Spelter, St. Louis	5.75	5.75	6.15	5.00
Lead, New York	4.50	4.50	4.45	4.50
Lead, St. Louis	4.471/2	4.50	4.35	4.421/2
Tin, New York	30.20	29.871/2	28.50	28.35
Antimony, Hallett, New York	8.25	7.871/2	7.871/2	7.25
Nickel, New York	40.00	40.00	38.00	40.00
Tin Plate, Domestic, Bessemer,				
100 pounds. New York	3.74	8.74	3.74	3.64

Chicago.

FISHER BUILDING, April 5, 1905.—(By Telegraph.)

The market situation is full of interest not unmixed with a feeling of considerable uncertainty as to the future. Producers have on their books almost without exception business enough to keep them busy the balance of the first half of the year, but an element of uncertainty enters into the second half. In Bars, Plates, Sheets, Pipe and to some extent in other lines it is almost impossible for independent producers to secure new business because of the fact that consumers everywhere are covered with blanket contracts in larger tonnages than are likely to be used at prices from \$2 to \$4 a ton lower than to-day's figures. These contracts were made last summer and fall at a time when business was light and prices were low, and while consumers are realizing business that will call for a much larger percentage of the tonnages named in their contracts than they expected, there is still a sufficient surplus in sight to demoralize the current market for new business, because possessors of contracts for surplus tonnages are taking advantage of the profits shown by ordering the stuff fabricated and selling to their neighbors who are not covered. This accounts for the fact that Steel Bars are easily purchased in Chicago at about 1.60c. or possibly less, in place of 1.62½c., the official price; that Sheets can be bought at from 10c. to 15c. per 100 lbs. below official figures, and that in Plates where the mills are deluged with business prices are obtainable from possessors of blanket contracts somewhat below the present official prices. It is these speculative materials that

are unsettling the spot market to-day, and the disposition on the part of the mills to extend contracts that expire July 1 for a period several months beyond that time bids fair to prolong disturbing conditions. A second purchase of 1000 tons of small Billets by the Illinois Steel Company from a local works emphasizes the shortage on Billets and the transfer of some 30,000 tons of Steel Rails from a Chicago to a Pittsburgh mill shows that Western purchasers will from now on have to secure their Rails in Eastern markets. Though Western Plate mills are full and several months behind their orders, Western consumers can still secure prompt shipments from eastern Pennsylvania mills. Specifications on Sheet contracts are heavy, but there is a dearth of new business for reasons explained above. The same is true of Steel Bars. Iron Bars are weak at 1.60c. Large tonnages of Pipe contracted for by jobbers at the low prices of last fall are supplying the market to such an extent that new business with mills is light. Demand for Cast Iron Pipe is excellent, but mills are still able to make prompt shipments. Old Materials are a little stronger, with sales of 11,000 tons made by two Western roads. Pig Tin has advanced sharply owing, it is currently reported, to the cornering of the market. Spelter and other nonferrous metals are well known to be weak. Nails are being consumed in large quantities, but speculative lots purchased at the low prices of last fall and winter are disturbing the market.

Pig Iron.—The small lot buying of last week is giving place to inquiry for larger tonnages from the larger consumers, although these inquiries have not yet developed into orders. There is a disposition on the part of melters to cover for the third quarter, but prices, while steady, are not exactly strong. It develops that jobbers and consumers who contracted for larger tonnages than they can use are making sales of surplus tonnages at about 25c. under the present market. This is not a general condition, but local and occasional. One element of strength for second half Iron is the impression that furnaces will have to pay higher prices for Coke after their contracts expire in July than they have been paying, though Coke prices at the present time are none too strong. Several Southern furnaces are still staying out of the market for business at less than \$14, Birmingham, but as they are beginning to catch up with their orders this tendency is less strong than it was a month ago. We make no changes in our price-list, which is as follows:

Lake Superior Charcoal\$18.50 to \$19	.00
Northern Coke Foundry, No. 1 17.75 to 18	.00
	.50
	.00
	.50
	.30
	.80
	.65
	.90
	.40
	.90
	.65
	.90
	.40
	.75
	.15
	.50
Standard Bessemer 18.00 to 18	.50
Jackson Co. and Ky. Silvery, 6 % Silicon 21	.30
Jackson Co. and Ky. Silvery, 7 % Silicon 21	.80
Jackson Co. and Ky. Silvery, 8 % Silicon 22	.30
	.30
Alabama Basic	.65
Virginia Basic	.65
DIE COLL COLL COLL COLL COLL COLL COLL COL	

Billets.—Shortage in available supply of Billets of small sizes is illustrated in a second purchase of 1000 tons by a subsidiary company of the United States Steel Corporation from a local mill. The price is not divulged. Forging Billets of base sizes are being sold at from \$28 to \$30 and Rolling Billets from \$26 to \$28. Sheet Bars are quoted at \$28 to \$30.

Rails and Track Supplies.—The transfer of 30,000 tons of Standard Section Rails from the Illinois Steel Company to the Carnegie Steel Company last week illustrates the fact that the local mill is overcrowded with business. There are still a number of Western roads that are expected to come into the market for large tonnages, which must go to Pittsburgh or Eastern mills, the presumption being that the roads will have to pay the full freight from mill, or \$2.80 a ton more from Pittsburgh mills than if they had bought from the Chicago mill before it closed its books. Demand for Light Rails is increasing steadily and higher prices are looked for before long. Prices on Rails and Track Supplies are unchanged, as follows: Standard Section Rails, \$28 per gross ton at maker's mill in 500-ton lots or greater, plus full freight to destination; Light Section Rails, \$24 to \$27 per gross ton, according to weight and tonnage; Angle Bars, 1.40c. to 1.50c.; Spikes, 1.70c. to 1.80c.; Track Bolts, 2.40c. to 2.50c., base, with Square Nuts, and 10c. to 15c. higher for Hexagon Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs, above car lot mill prices.

Structural Materials.—Eight thousand tons of Structural Steel for the Netcher Building were placed last week with the Carnegie Steel Company and 600 tons for the Northern Trust Company Building with the American Bridge Company. There is an increasing evidence of short-

age of Structural Material, and the greatly delayed deliveries by mills are resulting in a marked increase in the sale of Structural Materials from store. Prices are unchanged, as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices for either random lengths or cut to lengths on Angles, Beams and Channels, base sizes, range from 2c. to 2.10c., with the usual extras for size.

Plates.—The liberality with which Plate users generally covered their requirements by contracts at the old prices is making it difficult for independent mills to secure a great amount of current business, notwithstanding the fact that the mills of the leading producers are so full of business taken at 1.40c., Pittsburgh, and above that they are unable to make satisfactory deliveries. It is only the exceptional buyer who did not cover by contract at the low prices of last fall, and who must have his material quickly who is willing to pay present prices. Official prices are unchanged, as follows: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—Consumers generally covered their requires

Sheets.—Consumers generally covered their requirements so broadly last fall at the basis of from 2c. to 2.10c., Pittsburgh, for No. 28, that mills cannot expect to get much business at the present 2.40c. schedule until the tonnages named on the old blanket contracts shall have been consumed. Price concessions are being named by mills that are anxious for immediate tonnage, and not a very large volume of business is tempted out of its hiding even by such concessions. Deliveries on Blue Annealed and Black Sheets are fairly satisfactory, but mills are far behind on Galvanized. Official quotations, Chicago, are based on the following for base widths and lengths: Blue Annealed Sheets, Nos. 9, and 10, 1.91½c.; Box Annealed Sheets, Nos. 18 and 20, 2.31½c.; do., No. 27, 2.47½c.; do., No. 28, 2.56½c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.55c. for Nos. 18 and 20 Box Annealed, 2.70c. for No. 27 Box Annealed and 2.80c. for No. 28 Box Annealed. Galvanized Sheets are officially quoted at the following minimum prices at Chicago, in car lots from mill, base sizes: No. 10, 2.51½c.; Nos. 18 and 20, 2.86½c.; No. 27, 3.41½c.; No. 28, 3.51½c. Some mills ask 5c. and 10c. higher. Minimum store prices on Galvanized, base widths, are Nos. 10, 12 and 14, 3.10c.; Nos. 22 and 24, 3.25c.; No. 27, 3.70c.; No. 28, 3.95c., with the usual differentials between gauges and extras for widths and lengths.

Bars.—While it is impossible to buy Steel Bars from any of the leading producers at less than 1.66½c., base, half extras, Chicago, in car lots, and even at that price deliveries would be greatly delayed, it is possible to pick up Steel Bars from a variety of sources at about 1.60c., Chicago, the sellers being holders of contracts at the old 1.30c., Pittsburgh price, for larger tonnages than they will themselves consume. Iron Bars have declined and are now weak at 1.60c., base, half extras. Specifications on Old Steel Bar contracts based on the 1.30c., Pittsburgh price, are very heavy. Official prices are unchanged at 1.66½c., base, half extras, in car lots from mill. Iron Bars and Bands are firm at 1.62½c. to 1.65c. Current business on Soft Steel Bars and Hoops is naturally light, because most of these materials are bought on long time contract, but specifications on such contracts are highly satisfactory. Soft Steel Angles and other Shapes in the Bar class are firm at 1.76½c., half extras, in car lots. Hard Steel Bars, Angles and Shapes rolled from Old Rails are quoted at about \$2 a ton below the same goods in Soft Steel. Hoops are firm at their new price of 1.81½c., base, full extras, Chicago. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—Specifications from implement makers are extremely heavy and are about a month earlier than is ordinary. Prices are unchanged, as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel,

2.23½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to Sc.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—Jobbers and holders of contracts on Pipe bought at the lower prices of some months ago are supplying the consumptive demand to such an extent that new mill business is light. Independent Pipe mills are confronted at every hand with competition of this kind, which disturbs the market with price concession. Official prices, however, are unchanged, base sizes, \(^3\)4 to 6 inches being quoted in car lots, Chicago, at 73.85c. for Black Steel and 63.85c. for Galvanized Steel; 72.85c. for Black Iron and 62.35c. for Galvanized Iron, with the usual differentials for smaller and larger diameters and for X and XX strong.

Boiler Tubes.—Demand for locomotive sizes is increasing rather than diminishing, and mills are falling farther and farther behind in their ability to meet buyers' wishes as to deliveries. Merchant Boiler Tubes are also quite strong. Prices are unchanged on car lots, Chicago, for base sizes, 2\% to 5 inches, at 64.35 for Steel, 53.35 for Iron and 52.85 for Seamless. Larger and smaller diameters take the usual extras in price, and less than car lots are quoted at two points less discount. Store prices at Chicago are unchanged and business is reported to be heavy, the greatly delayed deliveries of mills resulting in increased business. We quote from store:

	Steel.	Iron.	Seamless.
1 to 11/2 inches	 40	35	421/2
1% to 2% inches	 50	35	30
2½ inches	 521/2	35	371/2
2% to 5 inches	 60	471/2	421/2
6 Inches and larger	 50	35	

Cast Iron Pipe.—The city of Chicago placed an order with the leading producer for 8400 tons, and a number of smaller orders were received from other municipalities. Much business is being held up until the spring elections are decided. Michigan City, Ind., is in the market for 10,000 feet of 6-inch and 1000 feet of 12-inch Water Pipe, and St. Louis is preparing plans for about 18 miles of water mains, ranging from 6 to 24 inches. Prices on ordinary lots at Chicago are as follows: \$29 a gross ton for 4-inch Pipe and \$28 for 6-inch and larger, with \$1 a ton higher for Gas Pipe.

Old Materials .- More than \$150,000 was paid for Old Materials sold by two railroads this week. Of the tonnage sold the Illinois Central disposed of about 10,000 tons and the Chicago & Northwestern about 1000 tons. Prices rethe Chicago & Northwestern about 1000 tons. Prices received by these two roads rule, if anything, a little higher than last week's schedule. The following list gives the range of quotations which represent the market condition both from the standpoint of the large seller and the large buyer, the prices representing the figures at which car lots or greater can be bought from railroads and from dealers:

Old Iron Rails\$20.00 to \$	\$20.50
Old Steel Rails, 4 feet and over 15.75 to	10.20
Old Steel Rails, less than 4 feet 15.25 to	15.50
Heavy Relaying Rails, subject to in-	
spection	23.00
Heavy Relaying Rails, for side tracks 20.00 to	20.50
Old Car Wheels 16.00 to	16.50
Heavy Melting Steel Scrap 14.75 to	15.00
Frogs. Switches and Guards 14.50 to	15.00
Mixed Steel	13.00

The following quotations are per net to

E	e following quotations are per net ton:		
	Iron Fish Plates	17.50 to \$18.00)
	Iron Car Axles	21.75 to 22.25	
	Steel Car Axles	16.50 to 17.00)
		16.50 to 17.00)
		15.50 to 16.00)
	Shafting	16.50 to 17.00	1
		12.50 to 13.00)
		11.75 to 12.00)
	No. 1 Cut Busheling	11.25 to 11.50)
	Iron Axle Turnings	11.50 to 12.00	}
		11.50 to 12.00)
	Machine Shop Turnings	11.00 to 11.50)
	Cast Borings	8.75 to 9.00)
	Mixed Borings, &c	8.75 to 9.06)
	No. 1 Mill	9.75 to 10.00	
	Country Sheet	8.00 to 8.50	
	No. 1 Boilers, cut to Sheets and Rings.	11.50 to 12.00	
	No. 1 Cast Scrap	14.50 to 15.00	
	Stove Plate and Light Cast Scrap	11.50 to 11.75	
	Railroad Malleable		
	Agricultural Malleable	12.25 to 12.50	
	Agricultural Maneable		

Metals .- Aside from the sudden bulge in the price of Tin, the metal market is uneventful and current business is light. It is understood that the advance in Tin is due to a light. It is understood that the advance in Tin is due to a manipulative corner in both London and New York. Spelter has fallen off \(\frac{1}{2} \)c., due to slow demand. Copper is held at \(15\frac{1}{2} \)c. to \(15\frac{1}{2} \)c. for Casting, and \(15\frac{1}{2} \)c. to \(15\frac{1}{2} \)c. for Lake, in car lots, with \(\frac{1}{2} \)c. higher for small lots. Lead is quoted in 50-ton lots at \(4.45 \)c., in car lots at \(4.50 \)c. and \(5c. \) to \(5\frac{1}{2} \)c. in small lots; \(Pig \) Tin at \(31c. \) to \(31\frac{1}{2} \)c. in car lots and \(31\frac{1}{2} \)c. in less than car lots. Spelter is in slow demand, the car lot price being \(6c. \) and the small lot price \(61\) c. Sheet \(7 \) in \(61\) and \(61\) and \(61\) c. Sheet \(7 \) in \(61\) and \(61\ demand, the car lot price being oc. and the small lot price 61/4c. Sheet Zinc is held at \$7.50, base, La Salle, equivalent, after deducting discounts, to \$7.25, Chicago, for car lots of 600-lb. casks, with small lots selling at \$7.50 to \$8. Prices of Old Metals are as follows: Copper Wire, 13½c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 12c.; Red Brass, Borings, 10%c.; Yellow Brass, Heavy, 9c.; Yellow Brass Borings, 7½c.; Light Brass, 7½c.; Lead Pipe, 4½c.; Tea Lead, 3.85c.; Zinc, 4.35c.; Pewter, No. 1, 19½c.; Block Tin Pipe, 25c.

Coke .--The presence in the market of large tonnages of demurrage Coke has again demoralized local prices, Foundry Coke being purchasable here at from \$5 to \$5.40 a ton from a great variety of districts, sellers being consignees who are forced to make quick turns. For contracts made with the representatives of the Connellsville operations \$3 at the ovens, or \$5.65, Chicago, is the going price, and most of the Connellsville ovens refuse to sell at less, though \$5.40, Chicago, is obtainable from a number of operations.

The Continental Iron & Steel Company of New York and Pittsburgh has just established a branch office in Chicago under the management of I. N. Wolfstein. The Chicago office has been established at 1747 Railway Exchange Building. This company deals in Old Materials as well as in Bar Iron and Steel, Relaying Rails and Railroad Supplies.

Cincinnati.

FIFTH AND MAIN STS., April 5, 1905 .- (By Telegraph.)

Pig Iron.-The market during the past week has been devoid of any special features and the buying movement has been very much restricted. Sellers without exception say that the week has been the dullest and that the smallest tonnage has been sold of any similar period since the first of the year. Not only is this true of the actual sales, but the same applies to the matter of inquiry, which, with one possible exception from a large melting concern for 5000 tons of Northern Iron, is confined entirely to actual needs in small lots. Consumers as a rule are said to be fully covered until July and are averse to entering the market until such time as this supply is exhausted, evidently preferring to take a chance on the market assuming a lower figure than at present. As matters now stand the market is strong and there is no apparent sign in any quarter of any weakness. Just what effect the merger of Southern furnaces will have on the situation is a matter of much comment, and opinions differ very materially as to the outcome. We learn of one of the large Southern producers, which, until the last few days, was quoting on a \$13.75 basis, now being willing to dispose of a limited amount of its output for \$13.50, evidently not being able to dispose of its output for \$13.50, evidently not being able to dispose of its Iron as rapidly as desired. General jobbing foundry trade continues quiet and there are no signs of any improvement in this direction. The Pipe shops are said to have all they can do and are melting a large tonnage. While apparently not in the market at any particular time for any limited amount, they are said to be willing to take offerings suited to their requirements, other conditions being equal. Freight rates from Hanging Rock conditions being equal. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern														
Southern														
Southern	Coke.	No.	3.			0	 		 		 1	5.75	to	16.00
Southern	Coke.	No.	4.			*			 		 . 1	5.25	to	15.50
Southern	Coke.	No.	1 8	Sof	t.		 				 . 1	6.75	to	17.00
Southern	Coke,	No.	2 8	Sof	t.		 		 	0	 . 1	6.25	to	16.50
Southern	Coke,	Gra:	y F	'or	ge		 		 		 1	5.25	to	15.50
Southern	Coke,	Me	ttl	ed			 	0			 . 1	4.75	to	15.00
Ohio Silv	ery, N	0. 1.					 		 		 2	0.65	to	21.15
Lake Suj	perior	Coke	e. :	No		1	 				 1	7.40	to	17.65
Lake Suj	perior	Cok	е.	No		2	 		 		 . 1	6.90	to	17.15
Lake Suj														

Car Wheel and Malleable Iron.

Standard Southern Car Wheel......\$18.50 to \$19.00
Lake Superior Car Wheel and Malleable 18.00 to 18.50
Coke.—Trade is reported quiet and the market is easy.
The car situation has eased very much and a fair supply is readily obtainable. Especially is this true in the Connells—
illustrate although come trouble is still experienced in ville district, although some trouble is still experienced in this line in the Virginia fields. Prices are practically as reported last week, the best grades of Connellsville Foun-dry selling from \$2.75 to \$3, f.o.b. ovens.

Plates and Bars.—The demand for Finished Material is increasing each week and the mills, which are running to is increasing each week and the mills, which are running to their full capacity, are said to be crowded to their utmost to make deliveries. The question of equipment still appears to be a very important factor in the situation and is the cause of very serious delays. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots; in smaller late, 1.73c., in carload lots; in smaller Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; smaller lots, 2c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, % x 3-16 and heavier, 1.83c., in carload

Old Material.—Trade is said to be only fair for this class of material, dealers complaining that they are unable to dispose of their stock as rapidly as they could desire. A fairly normal condition, however, obtains and the situation is somewhat better than it was a month since. Prices, as far as can be obtained, are unchanged. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$17 to \$18 per net ton; No. 1 Cast Scrap, \$14 to \$14.50 per net ton; Iron Rails, \$21.50 to \$22 per gross ton; Steel Rails, rolling mill lengths, \$14.50 to \$15 per gross ton; Relaying Rails, 56-lb. and upward, \$23 per gross ton; Iron Axles, \$21 to \$22 per net ton; Car Wheels, \$16 to \$17 per gross ton; Heavy Melting Scrap, \$14.50 to \$15 per gross ton; Low Phosphorus Scrap, \$17 to \$18 per gross ton.

Pittsburgh.

PARK BUILDING, April 5, 1905.—(By Telegraph.)

Iron Ore .- Arrangements are being made by the Ore producers to bring down this year from 32,000,000 to 33,-000,000 tons of Ore. Last year the opening of lake navigation was very late, and this, with labor troubles, caused a very light Ore carrying movement until along in August and September. In October last year 4,000,000 tons of Ore were brought down, the heaviest movement in any one month last year or in previous years. The United States Steel Corporation has been preparing for some months to bring down an enormous tonnage of Ore this year, and has added very largely to equipment of its two Ore carrying roads in the way of new engines and cars. It is said that the Northern roads are in very good shape to haul an immense tonnage of Ore to the lake points, while the vessel capacity is ample to bring it down the lakes. It is a question, however, whether the railroads that haul the Ore from the docks to the blast furnaces will be able to handle the enormous tonnage, and a congested condition in these roads just as soon as the Ore movement opens is freely predicted.

Pig Iron.—We can report a very strong condition in the Pig Iron market. Blast furnace returns so far received indicate that the output of Pig Iron in March will approximate 1,850,000 tons. This enormous output is being steadily consumed, and stocks are not only light, but are decreasing. Bessemer and Basic Pig Iron continue to rule very firm at \$15.50, Valley furnace, but occasionally some Basic changes hands on the basis of \$15.40, Valley furnace. Sales of about 15,000 tons of Basic to the Steel Corporation and 6000 tons to a local Sheet interest were made last week at \$15.40, at furnace. Foundry Iron is very firm on the basis of \$16 to \$16.25 for Northern brands of No. 2, and in the past week sales of 15,000 tons or more were made at these prices, of which 7000 tons went to the Standard Sanitary Mfg. Company for its works at New Brighton, Pa. Northern Forge Iron is strong at \$15.15 to \$15.25, Valley, or \$16 to \$16.10, Pittsburgh.

Steel.—The demand for Steel continues very active, and prompt deliveries of Billets or Bars are almost impossible to get. Bessemer and Open Hearth Billets range from \$23 to \$24, and Long Sheet and Tin Bars are \$26, maker's mill. Forging Billets are \$26 and upward, depending on carbons.

(By Mail.)

The past week has been a somewhat active one in the Iron trade, particularly in Pig Iron, the United States Steel Corporation having come into the market yesterday and bought 25,000 tons of Standard Bessemer Pig Iron from the Bessemer Pig Iron Association for April shipment at \$15.50, Valley furnace. The corporation also bought about 13,000 tons from outside furnaces at about \$15.40, at furnace, the greater part of this tonnage being Basic Iron. It is said the corporation would have bought a larger tonnage of Pig Iron for April shipment, but was unable to get it. The Standard Sanitary Mfg. Company has bought about 7000 tons of Northern Foundry Iron for its New Brighton works on the basis of \$16 to \$16.25, Valley furnace. A local Sheet interest has bought about 6000 tons of Basic Iron at \$15.40, Valley furnace, or \$16.25, Pittsburgh, shipments being April, May and June. There is a good deal of inquiry for second and third quarter deliveries. One leading interest is out of the market as a seller for April delivery, and has very little Iron to spare for May. Bessemer and Basic are very firm at \$15.50, Valley furnace, while Northern No. 2 Foundry is \$16 to \$16.25, at maker's furnace. Forge Iron is firmer, and there is some inquiry for May and June shipment. Northern brands are held at \$15.15 to \$15.25, Valley furnace, or \$16 to \$16.10, Pittsburgh.

There is no let up in the demand for Steel, which is enormously heavy, and keeps the mills from three to four weeks or longer behind in deliveries. Bessemer and Open Hearth Billets readily command \$23 to \$23.50, and Sheet and Tin Bars \$26, at maker's mill. There is a continued scarcity of Open Hearth Steel, and good premiums are being paid for prompt deliveries.

There has been a heavy movement in Ferromanganese

and an advance in prices of at least \$5 a ton. The increased output of Coke is commencing to tell, and prices on Furnace Coke are easier, sales having been made recently at \$2.25 a ton. The railroads are moving Coke very promptly and consumers are well supplied.

In Finished Iron and Steel the market is in very satisfactory shape, the demand being good all along the line and the mills being filled up with tonnage for several months ahead. The seasonable weather of the past two weeks has had a very beneficial effect in an increased demand for such products as are used in outdoor construction. Demand for Plates, Sheets and Tin Plate is exceptionally heavy.

Ferromanganese.—There has been a very heavy movement in Ferromanganese in the past two weeks, the Carnegie Steel Company being a buyer of foreign Ferro to the extent of 18,000 to 20,000 tons. Other consumers have bought heavily, and prices have shown a very sharp advance. English 80 per cent. Ferro is now quoted at \$50 in large lots delivered at buyer's mill. We note a sale of 200 tons of foreign Ferro at \$48.50, one of 500 tons at \$49.50, while several sales are reported at an even \$50. All indications point to higher prices.

Rods.—As noted last week, there is a scarcity of Rods and the market is very firm. The absolute minimum on Bessemer and Open Hearth Rods is \$34, while some sellers quote \$35, maker's mill. Chain Rods are held at \$35 to \$36, maker's mill.

Skelp.—The market is fairly active, the mills having some good sized contracts on which shipments are being made right along. Prices are firm and we quote Grooved Iron Skelp at 1.70c. to 1.75c., Sheared at 1.80c. to 1.85c., Grooved Steel Skelp, 1.65c., and Sheared, 1.70c. to 1.75c. These prices are for ordinary widths and gauges and are f.o.b. maker's mill.

Muck Bar.—The demand is more active and prices are firmer. We quote best grades of Muck Bar made from all Pig Iron at \$28.50, Pittsburgh, and note a sale of 500 tons at that price.

Steel Rails.—The situation in the Rail trade is looking a little better, a number of roads that placed contracts some time ago having recently come in the market for additional tonnage. Some great records for output of Rails are being made by the Edgar Thomson Works of the Carnegie Steel Company. We quote Standard Sections at \$28 at mill. Light Rails are \$24 to \$27, depending on weight.

Structural Material.—The Structural trade is looking very much better, some heavy contracts having been placed and other large work is in sight. The American Bridge Company has taken a contract from the National Tube Company for 20,000 tons of Structural Steel for the new buildings to be erected at the McKeesport works. A number of other large contracts are just on the point of being closed. A great deal of work for new manufacturing plants is in sight which will aggregate considerable tonnage. The Structural mills continue to report trouble in getting deliveries of Structural Shapes rolled from Open Hearth Steel. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ½ inches, 1.60c.; over 15-inch, 1.70c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—The general demand for Plates is quite good, the smaller mills having a good run of work, while the larger interests, such as Carnegie Steel Company, Jones & Laughlin Steel Company and others, are simply congested with tonnage. The Steel car builders continue to be very heavy buyers of Plates and have practically filled up the leading mills for the next three or four months or longer. We are advised that official prices are being firmly held and we quote: Tank Plate, ¼-inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are sfollows:

-		
		Extra per
	Gauges lighter than 1/4-inch to and including 3-16	
	inch Plates on thin edges	. \$0.10
	Gauges No. 7 and No. 8	15
	Gauge No. 9	25
	Plates over 100 to 110 inches	05
	Plates over 110 to 115 inches	10
	Plates over 115 to 120 inches	15
	Plates over 120 to 125 inches	25
	Plates over 125 to 130 inches	50
	Plates over 130 Inches	. 1.00
	All sketches (excepting straight taper Plates vary	V-2
	ing not more than 4 inches in width at end	B.
	narrowest end being not less than 30 inches)	10
	Complete Circles	20
	Boiler and Flange Steel Plates	10
	Marine, "A. B. M. A.," and ordinary Fire Bo	Y
	Steel Plates	20
	Still Bottom Steel	30
	Locomotive Fire Box Steel	50
	Shell Grade of Steel is abandoned.	
	Tonice Not each 20 dams For entidented w	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be

charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of $\frac{1}{2}$ of 1 per cent. is allowable. Pacific Coast base, 1.40c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 mches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—There is nothing of special interest to report in the Sheet market. The current demand is of fair proportions, but the large trade covered heavily before the recent advance in prices. The demand for Roofing Sheets is much better, and the Sheet trade as a whole is in a very satisfactory condition. Prices are firm, and we quote: Black Sheets, No. 24, box annealed, one pass through cold rolls, 2.15c.; No. 26, 2.25c.; No. 27, 2.30c., and No. 28, 2.40c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.23c.; No. 28, 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at \$2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—New tonnage in Iron and Steel Bars is of moderate volume, but leading consumers are pretty well covered on contracts placed some time ago, and on which they are specifying very freely. The leading Bar mills are filled up with work for the next two or three months, and on Steel Bars are three to four weeks behind in deliveries. We quote Common Iron Bars at 1.65c. to 1.70c. and Refined Iron Bars 1.70c. to 1.80c., f.o.b. Pittsburgh. We quote Bessemer and Open Hearth Steel Bars at 1.50c., base, in carloads and larger lots, with the usual advance for smaller lots.

Hoops and Bands.—We continue to quote Steel Hoops at 1.65c. and Steel Bands at 1.50c., base, half extras, as per National Steel Bar card. There is very little new demand for either Hoops or Bands, consumers being covered by long time contracts on which they are specifying quite freely.

Cotton Ties.—No price has yet been fixed on Cotton Ties for this season's delivery, but the mills are expected to get together within the next few days to fix a price.

Tin Plate.—The demand for Tin Plate shows no abatement and the mills have all they can do to take care of new business and old contracts. Shipments of Tin Plate in March by the leading interest and by the independent mills as well were much the heaviest in any one month in the history of the Tin Plate trade. Pittsburgh is to have a new Tin Plate and Sheet mill in the near future; J. R. Phillips and associates have bought the plant of the Jackson Sheet & Tin Plate Company at Clarksburg, W. Va., and will move it to the Pittsburgh district at once. We quote 100-lb. Cokes at \$3.50, net, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days.

Merchant Pipe.—The demand for Oil country goods continues very dull, but on Merchant sizes of Pipe is fairly active. Prices are firm, discounts to consumers in carloads being as follows:

Merchant Pip	16	C										ĺ		ĺ	ĺ	ĺ	ĺ	ĺ	į	
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S1	teel.		ron.——	-
Black.	Galv. Per cent.	Black.	Galv.	
1/2 and 1/4 inch671/2	511/2	651/2	491/2	
% and 1/2 inch711/2	591/2	691/2	571/2	
% to 6 inches751/2	651/9	74	64	
7 to 12 inches701/2	551/2	69	531/2	
Extra strong, plain ends,		mar.		
% to % inch60%	481/2	581/4	461/2	
16 to 4 inches 671/9	551/9	651/9	531/2	
41/2 to 8 inches631/2	511/2	6134	491/2	
Double extra strong, plain	483/	W 41/	401/	
ende 14 to 8 inches 5814	4514	8414	4914	

Boiler Tubes.—We are advised that the demand for Boiler Tubes is very heavy, the leading mills being three to four weeks behind in deliveries. Discounts in carloads are as follows:

		E	0	11	er	. 3	T	ul	e	8.								
1 to 11/2 inches																	Iron.	Steel.
1% to 2% inches.				0			0	0 0		0					0	0	48	58
2½ inches										0	0		0 0		0		48	60
2% to 5 inches	0 1			0	0 0	0		0 0	0	0	0	0	0 0	0	0	0	55	66

Merchant Steel.—New tonnage is rather light, but specifications on contracts are coming in very freely. Some inquiries from large consumers are in the market for supplies running over last half of this year and first half of next. Prices are firm, but unchanged, and we quote: Tire Steel, 1.65c. to 1.75c.; Smooth Finished Machinery Steel, 1.75c. to 1.85c.; Open Hearth Spring Steel, extra quality, 2.25c. to 2.50c.; Tool Steel, ordinary grades, 5%c. to 8c.; extra grades, 10c. and upward. We quote Cold Rolled Shafting at 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—Makers of Spikes have all the business they can take care of and are from two to three weeks behind on shipments. We quote Railroad Spikes at \$1.70 per 100 lbs. in carload lots and \$1.75 per 100 lbs. in smaller lots, f.o.b. maker's mill.

Spelter.—There has been a heavy decline in prices of Ore and Spelter has gone off in sympathy. We quote prime

grades of Western Spelter at 5.80c., St. Louis, or 5.92½c., Pittsburgh. The market is soft, and this price would probably be shaded on a firm offer.

Connellsville Coke.—Prices of Furnace and Foundry Coke are somewhat easier, due to the very heavy output, and also to the fact that the railroads are furnishing an ample supply of cars. Strictly Connellsville Furnace Coke for prompt shipment is being offered at \$2.25 a ton, and 72-hour Foundry at \$2.75 to \$3 a ton. Main Line makes of Coke are being offered on the basis of \$2 to \$2.10, for furnace and \$2.50 to \$2.75 for Foundry for prompt shipment. Output of Coke in the Upper and Lower Connellsville regions last week was 347,078 tons, the heaviest output in any one week in the history of the Coke trade.

in the history of the Coke trade.

Iron and Steel Scrap.—There is a little more inquiry for Scrap, but the amount of tonnage being actually sold is relatively small. Heavy Melting Stock in small lots can be had at \$16 to \$16.25, but on large lots \$16.50 is quoted. For the other grades dealers quote as follows: Bundled Sheet Scrap, \$14.50; No. 1 Wrought Scrap, \$19.50; Wrought Iron Turnings, \$13.50 to \$13.75; Cast Iron Borings, \$10.25 to \$10.50; Steel Rails, short pieces, \$15.75 to \$16; No. 1 Cast Scrap, \$15.25 to \$15.50; Iron Car Axles, \$22 to \$23, all in gross tons, f.o.b. Pittsburgh.

Harry O. Price, formerly local sales agent for Joshua W. Rhodes & Co., manufacturers of Pig Iron, has severed his connection with that firm and has been appointed resident agent for Walter-Wallingford & Co., dealers in Pig Iron and Coke, with offices in Room 2202, Farmers' Bank Building, Pittsburgh. Mr. Price will cover the entire Pittsburgh district and adjacent territory.

Birmingham.

BIRMINGHAM, ALA., April 3, 1905.

The Iron market the past week was not one of great activity, but it was one of great expectations. A fair amount of inquiry resulted in a moderate business. Prices were not as well maintained as the more hopeful in the trade anticipated, and, compared with the immediate past, the market was easier, but there was no flurry. Of late these letters have stated that the business transacted was mainly at the maximum quotations, with occasional sales at the inside prices given. This order was reversed the past week, and the main business concluded was at the minimum values, with some once in a while at the maximum quotation.

One transaction, involving 4000 tons, was reported by a leading interest at a value based upon \$13.75 for No. 2 Foundry. This would make No. 3 Foundry \$13.25 and No. 4 Foundry \$13, with Gray Forge at \$12.50 to \$12.75. Several other transactions, covering in each case 1000 tons, were reported on the same basis. In most of the sales reported, delivery was confined to the second quarter with a sprinkling of deliveries well into the third quarter. As far as can be learned sellers are not offering Iron for long deliveries and nearly all such transactions are originated by the buyers. While the seller in almost all cases contends for a premium over current values for these deliveries the buyers in frequent cases persist in refusing to grant it. But some of this business constantly slips in and the sellers are saying nothing about it. Transactions for the more deferred deliveries are increasing in both number and volume, but they cannot be said to be active. As far as they can do so the sellers are confining deliveries to 90 days ahead. Shipments continue very good and there are, as the trade expresses it, very few holdbacks. As a rule the trade is taking its purchases right along. One reason given for the softening of the market was that the demand was from competitive territory and prices had to be made to meet it to secure business.

It may be that the improving prospects for increased output in the pean future received.

It may be that the improving prospects for increased output in the near future were not without some influence in shaping values. The Tennessee Company has in Alabama eight furnaces in blast and has seven out of blast. It is preparing to add three more for operations at Bessemer and the balance just as rapidly as the fuel supply will permit. In addition to this its new furnace, the largest in the South, is now having the finishing touches put on and the management anticipates that in two weeks' time the fires will be lighted and it will make 300 tons or more per day. The company's action indicates that it has confidence in its ability to keep its furnaces supplied with fuel hereafter. The inability to do this since the inauguration of the strike was the cause of the furnaces being idle. The company believes now that it has overcome the difficulties that seemed overwhelming.

company believes now that it has overcome the difficulties that seemed overwhelming.

The Tennessee Company's Steel mill at Ensley has been making new records of late. For the month of March just ended the mill produced 23,003 gross tons of Ingots. The best previous month's production was 21,487 tons. The Rails produced for March amounted to 16,250 tons and the maximum production of any previous month was 16,134 tons. The best record for any 24 hours' production was

made on March 29 and was 1020 tons of Ingots. These figures show a great improvement in the efficiency of the

mill and give great satisfaction to the management.

The Pratt Consolidated Coal Company is having turned over to it the properties with which it combined, and so far the papers representing \$400,000 of value have been filed for record. It is said that this amount represents not quite one-half the total value of the mines absorbed by the consolidation.

The situation as regards Coal and Coke has improved very perceptibly and a continuance of the improved conditions is anticipated by the operators.

Considerable activity is noted at both the Dimmick Pipe

Considerable activity is noted at both the Dimmick Pipe works and the plant of the United States Cast Iron Pipe & Foundry Company, at Bessemer. At both plants the improvements mentioned some time since that would be made are well under way. Business is not in a rushing condition, but both plants are in comfortable circumstances so far as future operations are concerned.

Charcoal Iron has been and continues to be in good demand. The buyers are car wheel makers. Quotations are given at \$17 to \$17.50. The continuance of the demand at the moment appears to be very favorable.

The Tennessee Company has started about placing its Coke very in continuance of the demand at the moment appears to be very favorable.

The Tennessee Company has started about placing its Coke ovens in operation again and expects to pull Coke continuously from those they are starting up and to add to the number as circumstances permit

the number as circumstances permit.

Through the efforts of the Commercial Club the statue of Vulcan has been brought back home from the St. Louis Fair and will be placed on a high pedestal on a Red Mountain ridge, towering altogether about 150 feet above the surroundings.

Cleveland.

CLEVELAND, OHIO, April 4, 1905.

Iron Ore.—All obstacles seem to have been removed and the season of navigation will probably open about April 10. The labor difficulties have cleared remarkably in the past week. The members of the Longshoremen's Union and the dock managers are in session and have been in consultation for the past six or eight days. The issue is accurately defined. The longshoremen want more pay and shorter hours, but no question of a sympathetic strike, in case the pilots of the lakes are not recognized, has been raised. Since the masters have hired all of their mates and all boats are fully equipped and since the longshoremen's conference is drawing to a close it is hardly to be expected that the question will be raised at this late date. Regardless of the near approach of the first shipments for the season, nothing has as yet been done about the establishment of the wild rates on Ore for the first cargoes. It is possible, since this has not been discussed, that there is a general understanding that the wild and contract rates from the start will be identical. There are still reported some small sales of Ore at the old prices. The rates which will prevail on the movement will be 75c. from Duluth, 70c. from Marquette, and 60c. from Escanaba. Prices hold at \$3.75 for Bessemer Old Range, \$3.50 for Bessemer Mesaba, \$3.25 for non-Bessemer Old Range and \$3 for non-Bessemer Mesaba, all prices being f.o.b. Lake Erie ports.

Pig Iron.—The only change in the Foundry Pig Iron situation during the past week has been the increase in buying for second half delivery. This increase has been in accordance with the promise in the buying which has been seen here of late. Buyers are looking forward to their needs for the second half with a good deal of confidence in the conditions of business, which is indicated by the heavy buying at the present time. Some of the furnaces in this territory are reporting heavy sales for both third quarter and second half, and some of them report that they are pretty well sold up or as nearly sold up as they dare to be. There has been no disposition to deviate from the price which has been paid heretofore—namely, \$16 in the Valleys for No. 2. The Southern furnaces are still quoting \$13.50, Birmingham, for No. 2, to which is added \$3.85 to make the Cleveland price. At this price not much is being done in this territory. There is little change locally in either Bessemer or Basic. The latter is especially strong, however, due to a good demand and a comparative shortage of the material. Prices on both Bessemer and Basic hold at \$15.50 to \$16 in the Valleys, the latter price being on the smaller and less desirable orders.

Finished Iron and Steel.—Deliveries are giving the mills more concern than new orders. The advantage accruing to the jobbers and to the small mills from this situation is one of increasing importance. The jobbers are getting a good run of business, amounting to one to three carload lots at a time. The smaller mills, which have been holding their capacity free from contracts, are also able to market their product now at a premium, which they have been doing in a limited number of cases. The market, however, has not reached a point where premiums to the small mills are general. The strongest point in the market is the Billet situation, the mills offering deliveries only inside of nine months. There have been a good many sales here of late at

\$27, Pittsburgh, for Bessemer 4 x 4, the buyers being willing to wait for their deliveries. The Structural Steel situation has also gained strength in Cleveland during the week by the announcement of several new building projects which will require a good deal of Steel. The question will be principally one of getting the Steel with which to carry on the intended constructions. Most of them now under contemplation will not be ready, however, for the Steel until the latter part of June or early in July. Those who are needing Steel now are buying principally from the jobbers, paying the premiums on what they are in need of. The Bar situation is strong, with a good run of Bar Iron orders at 1.65c. to 1.70c., Youngstown. The best buying is perhaps in Bar Steel, some of the consumers covering their needs for a long period. The price holds at 1.50c., Pittsburgh, for Bessemer and 1.50c., Pittsburgh, for Open Hearth, with some consumers paying a premium of \$3 to \$4 a ton to get the Bessemer product shipped upon immediate specification. This week has also seen a good buying of Standard Rails for traction properties. One contract has been closed amounting to about \$000^{\circ} tons and others are pending. Traction line construction promises to be heavy this summer, affording perhaps the best market for Rails in this immediate territory. The Sheet trade is steady and strong. The quotations on Blue Annealed out of stock are based on No. 10 at 2.15c. American Bessemer out of stock is based on No. 28 at 2.80c. In carload lots at the mill Blue Annealed is based on No. 16 at 2.15c. On Galvanized Sheets the basis is 3.20c. for Nos. 22 to 24 out of stock and 2.90c. for the same gauges in carload lots at the mill.

Old Material.—The market has been steady, but not strong. Buying has been a little heavier, but mills are not yet taking large quantities. The dealers are fighting to maintain the old basis of prices. A good many articles are quoted nominally. The following quotations are continued, all gross tons: Old Steel Rails, \$16 to \$16.50; Old Iron Rails, \$22.50 to \$23; Old Car Wheels, \$16 to \$16.50; Heavy Melting Steel, \$16 to \$16.50. All net tons: Cast Borings, \$8.50 to \$9.50; No. 1 Busheling, \$14; No. 1 Railroad Wrought, \$16 to \$16.50; Iron Car Axles, \$21 to \$22; No. 1 Cast, \$13.50 to \$14; Stove Plate, \$11 to \$12; Iron and Steel Turnings and Drillings, \$11 to \$12.

Philadelphia.

Forrest Building, April 4, 1905.

The Iron market has been devoid of any special features during the past week, but it has maintained its full strength and on some grades has, if anything, become firmer. Foundry Irons have been in more or less good demand, mostly in lots of a few hundred tons, with an occasional order for a 1000-ton block for delivery during the third and fourth quarter of the year. Some round lots of Pipe Iron have been closed up, but Basic and Bessemer Irons have been rather quiet. Meanwhile prices have not quotably changed and the being former maintained are the control of the prices have not quotably changed and the being former maintained are the control of the prices have not quotably changed and y changed and Makers of Pig are being firmly maintained on all grades. Makers of Pig Iron have in some cases sold their output as far ahead as October at the ruling prices, and state their willingness to take further business for even extended deliveries on the same Both buyers and sellers apparently agree that present level of prices is about right, and that more business will result by maintaining them at or about this level than The marwould be the case if they were materially higher. ket is apparently under perfect control and those interested seem to be entirely satisfied with conditions as they exist. There is an increased demand for Plates and Structural Madeliveries are hardening, particularly for terial and Mills are running at full capacity and are taxed to keep up with the business already on their books.

Pig Iron.—The demand during the past week has run mostly to Foundry Irons, of which quite a large tonnage has been sold. Buyers continue to come into the market for their requirements during the third and last quarter of the year, and sellers have no hesitancy in accepting the business. The tonnage in this grade during the week has been made up largely of a number of orders for small lots, running from 100 to 500 tons, with an occasional order for 1000 tons at an average price of \$17.50 to \$17.75 for No. 2 X Foundry, according to quantity and point of delivery. There has been a fair tonnage taken by the various Pipe foundries; one lot of 2000 tons of Southern Iron being sold at the ruling Southern Association prices and a lot of 1000 tons of Northern Iron was sold at close to \$17, delivered. Small lots of Basic Iron were taken at \$16.75, delivered, but after the heavy sales of last week the demand for this grade has been rather quiet. An inquiry is out, however, for some 3000 tons for delivery during the last quarter. Low Phosphorus Pig is particularly strong. Furnaces making this grade have their tonnage pretty well sold up, and there is very little around for anything like early delivery. Sales have been made at an advance of 25c. above last week's quotations on lots of 500 tons at about \$20.60, delivered. Mill Irons are dull, and there has been little sale recently for Bessemer Pig. The following would be about the range

of prices for deliveries in buyers' yards, varying according to the point of delivery:

No. 1 X Foundry\$18.23	i to	\$18.50
No. 2 X Foundry	to	18.00
No. 2 Plain 17.28	to	17.50
Standard Gray Forge 16.00) to	16.50
Ordinary Gray Forge	to (15.75
Basic	5 to	17.00
Low Phosphorus	i to	20.75

Ferromanganese.—There have been some sales of round lots at advanced prices for Western delivery. There is an active demand and also an apparent tendency to mark prices up for early delivery. Sales have been made at \$48, although \$48 to \$49, delivered, is now being asked.

Muck Bars.—There is practically no change in the market for Muck Bars. Makers are asking \$28.75 to \$29.50, f.o.b. seller's mill. Low Phosphorus Bars are quoted at \$39 to \$40, but the demand is extremely light.

Plates.—The demand for Plates continues very strong. Contracts for good sized tonnages are coming in freely and specifications are being received almost too rapidly to suit the mills, which are being operated at their best capacity. Prompt deliveries are hard to obtain and, while prices are unchanged and very firm, it will soon be necessary—if not already an accomplished fact—to pay a premium for prompt deliveries. Meanwhile the following prices are quoted for local and nearby delivery:

local and hearby delivery.	
Carload. Cents.	
Tank, Bridge and Boat Steel, over 14 inches wide	1.781/2
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under 1.631/2	1.681/2
Flange or Boiler Steel	1.88½
Fire Box Steel. 1.93½ Still Bottom Steel. 2.03¾	2.081/2
Locomotive Fire Box Steel2.23½ The above are base prices for ¼-inch and heav	
lowing extras apply: 3-16-inch thick\$0.10	
Nos. 7 and 8, B. W. G	**
Plates over 100 to 110 inches	**
Plates over 115 to 120 inches	**
Plates over 125 to 130 inches	

Steel.—Steel continues in good demand. Mills have taken orders at \$30 for quick delivery and there is no difficulty in obtaining \$28 to \$29 for extended shipments.

Structural Material.—There has been a large increase in the tonnage taken and the demand continues very active. Orders are coming in freely and it is not unlikely that a bonus will be required for prompt deliveries before a great while. Meanwhile prices continue as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—There has been no change in the condition of the Bar trade. Mills continue very busy and premiums are necessary to obtain prompt shipments. Prices at which orders are entered are about as follows: Best Bar Iron commands from 1.73½c. to 1.80c., delivered. Steel Bars are 1.63½c. to 1.70c., but prompt deliveries cannot be had except at outside figures.

Sheets.—There is a strong demand, conditions generally being unchanged. Mills still find difficulty in making satisfactory deliveries. Prices are firm, ordinary Sheets being quoted as follows: 18 to 20 gauge, 2.40c.; 22 to 24 gauge, 2.50c.; 25 and 26 gauge, 2.60c.; 27 gauge, 2.70c., and 28 gauge, 2.80c. Best grades are two to three tenths higher.

Old Material.—There has been quite an active demand for Low Phosphorus Scrap, one lot of 2500 tons being sold at close to top figures, while some smaller lots were turned at about the same price. Otherwise the market for Old Material continues unchanged. Buyers and sellers seem to be unable to agree on prices for good tonnages, and both sides are marking time and waiting further developments. Bids and offers for deliveries in buyers' yards are about as follows, sales being largely at the medium or higher figures:

Old Steel Rails\$18.00 to \$1	18.50
No. 1 Steel Scrap 17.75 to 1	18.00
Old Steel Axles 22.50 to	23.50
Old Iron Axles 26.50 to 2	28.00
	26.00
Old Car Wheels 17.00 to	17.50
Choice Scrap, R. R. No. 1 Wrought 23.00 to 2	23.50
No. 1 Yard Scrap 20.50 to	21.00
Machinery Scrap 16.00 to	16.50
Low Phosphorus Scrap 21.50 to	23.00
Wrought Iron Pipe 16.50 to	17.00
	17.00
No. 2 Forge Fire Scrap, Ordinary 13.00 to	13.50
	15.75
Axle Turnings, Choice Heavy 16.50 to	17.00
Cast Borings 11.50 to	11.75
	14.00

The Norfolk & Western Railroad has ordered 1000 composite gondola cars from the South Baltimore Car Works and a like number from the American Car & Foundry Company.

The American Foundrymen's Association.

Dr. Richard Moldenke, Watchung, N. J., secretary of the American Foundrymen's Association, has issued a call for the eighth annual convention of that association. It will be held in New York City on June 6 to 8, and possibly may continue on the 9th. Arrangements are being made for headquarters and hotel accommodations as well as reduced railroad rates, announcement of which will be made as early as possible. A very large attendance is expected, as indicated by the inquiry from all over the country regarding New York City as the proposed meeting place. A number of interesting papers are promised, but the secretary requests more, so that a maximum of useful facts may be brought out for the benefit of the foundry industry.

The Mesta Machine Company's Plant Not Sold.—Reports in the daily press that the Mesta Machine Company, Pittsburgh, had sold, or was about to sell, its large plant at West Homestead are officially denied. George Mesta, president of the company, states that offers to purchase the plant have been made, but have not been accepted. It has a very large works, composed of foundry and machine shops, and builds heavy rolling mill machinery of all kinds, engines and ingot molds, and at the present time is very largely increasing its capacity. It proposes to retain possession of its plant and will execute its contracts as promptly as possible.

Several lighting and power projects are proposed for towns in the Straits Settlements, at the southern end of the Malay Peninsula, in Southeastern Asia. The town of Ipoh has appropriated \$90,000 for an electric plant, while the installation for Kula Lumpur will, it is estimated, cost about \$880,000. A Singapore corporation recently secured contracts for the installation in the palace at Kuala Kangso of the Sultan of Perak of a large electric equipment, and also for an additional plant at Penang, where an electric railway is being built to supersede the present horse cars.

The annual election of the New York Metal Exchange was held April 3 in the exchange building at Burling slip and Pearl street, when the following officers were reelected: President, Robert M. Thompson; vice-president, Adolph Lewisohn; treasurer, Robert L. Crooke; secretary, Carl Mayer; members of the Board of Managers: B. Rothschild, American Metal Company, Limited; H. W. Hendricks, Hendricks Brothers; L. Nachmann; G. E. Behr, Behr & Steiner; Wm. Jay Ives; George W. Jaques; J. H. Lang, National Lead Company; L. Vogelstein; Arbitration Committee: Edmund Hendricks, Hendricks Bros.; Morton B. Smith, M. B. Smith Company; J. Mitchell Clark, Naylor & Co.; E. A. Caswell; N. M. Macdonald, Vivian, Bond & Co.

The Great Northern Railway of England has been experimenting with gasoline motive power for suburban traffic. The car carries two 36 horse-power Daimler engines connected to a common longitudinal shaft, which drives the axles through bevel gears. To prevent one axle from overrunning another, due to inequality in the wheel sizes, a special form of differential gear is introduced in combination with the reversing mechanism. Two gasoline tanks carry fuel for about 400 miles. The car is lighted by electricity from storage batteries, which also operate the magnetic clutches and the ignition spark. The weight of the car with passengers is about 16 tons, and a speed of 30 miles per hour can easily be maintained, increasing on occasion to 50.

In one turn recently 488 tons of steel billets were made on the blooming mill at the Donora Steel Works of the Carnegie Steel Company at Donora, Pa. The same mill made a record of 874 tons of blooms and billets for the 24 hours ending March 30. This blooming mill was built and installed by Mackintosh, Hemphill & Co., Pittsburgh, and is making some very creditable records.

The Machinery Trade.

NEW YORK, April 5, 1905.

The activity in the machine tool trade which has been looked for from week to week has not yet materialized, and the opening of spring has not brought forth the business that was freely forecasted for this time. There are, however, so many large projects under way that there can be but little delay of extensive purchases of machinery. We refer to the large amount of tunnel and canal work to be undertaken this summer, which is being followed closely by the merchants in Liberty street. Notwithstanding the fact that no deals of magnitude were closed the week's business continued fairly good, though it was made up almost wholly of orders for small lots. Inquiries are as numerous as they have been for some time, but like the orders they cover only a few tools each. This steady demand for small lots of tools is certainly an indication of a healthy condition in the trade, and it will take but a few good sized contracts each week to place it on a basis where good profits will be realized. Some of the corporations which it was expected would ere this close for a goodly portion of their machinery requirements have deferred purchases either for financial reasons or because of the quietness prevailing in their respective lines. It might almost be taken as an axiom that "the man who owns the business spends the money," and consequently in a majority of cases he gauges his buying by the conditions in his particular line, regardless in many instances of actual necessities in the way of mechanical equipment.

Set and Cap Serew Prices Advanced.

A number of representatives of manufacturers of set and cap screws met in New York on Friday and agreed on a price-list to go into effect the following day wherever possible. Although those who participated in the meeting declared that no organization of any kind was formed. it is said that the manufacturers had a thorough understanding and the list they adopted is higher in several respects than the list of the average manufacturer has been of late. Ever since the United Screw Manufacturers' Association was disorganized 14 months ago there has been a rate war among the companies which has cut into the profits of some of them. The Iron Age announced last week that such a move was under way, and on Saturday L. M. Waite of the National Acme Mfg. Company announced that representatives of several companies had met in New York the day before and had adopted a price-list which was ready for distribution to the trade on April 1. The new list shows that square head screws have been eliminated from the list and prices on them are uniform with hexagon screws. There is an advance, according to the new list, in the price of set screws of between 8 and 9 per cent., and cap screws have been advanced about 1 1-3 per cent. in some sizes and a little more in others. Beyond the adoption of the price-list affecting only the set and cap screw trade, it could not be learned as to what was done at the meeting nor could the names of the companies be ascertained which participated in the movement. It is understood that most of those interested were Western firms.

Tunnel and Canal Work.

The Pennsylvania Railroad Company is now asking bids for the construction of its tunnel under Manhattan Island to connect the East River and North River sections, work on both of which is now well under way. The land section of the tunnel, on which estimates are to be submitted by April 18, will run from the shaft of the iron tube at the foot of Thirty-fourth street and East River to the new Pennsylvania station at Thirty-third street and Seventh avenue. In the construction of this tunnel very little, if any, castings will be used. As was the case with the construction of the Subway, a large amount of machinery will be required in building the tunnel, the two pieces of work being somewhat similar in regard to the material to be excavated.

John B. McDonald, the contractor who superintended the construction of the New York Subway and who is now connected with the Metropolitan Company, said this week that his company has plans for three subway lines on which it is prepared to bid for the privilege of constructing. The company will agree to build the lines simultaneously and have them completed within five years. The three lines the

company has laid out constitute a complete independent system of subways. They include a four-track subway in Third avenue from Harlem to the Battery, a four-track subway in Lexington avenue, Thirty-fourth street, Fifth avenue, Broadway, Vesey and Church streets to the Battery and a four-track line in Seventh and Eighth avenues from Harlem to the Battery. The plan also includes a cross-town line in Thirty-fourth street, connecting the Seventh avenue Harlem to the Battery. The plan also includes a cross-town line in Thirty-fourth street, connecting the Seventh avenue and Third avenue lines. The company is also considering the question of bidding on Brooklyn routes. No preliminary contracts have been given out, but preliminary estimates have been made by the Metropolitan Company's engineers and they have figured that the lines planned will cost about \$160,000,000. That figure is based on wide calculations and gives plenty of leeway.

The Rapid Transit Commission on Thursday received a

report from its Committee on Plans and Contracts proposing an elaborate network of subways, and it is probable that bids will be received on several of the routes next fall. Besides the Interborough and Metropolitan companies the Port Chester Railroad has signified its intention of bidding on

one or more of the routes.

The passage last week of a bill by the Dominion Parliament granting the Michigan Central Railroad permission to build the Canadian end of its proposed tunnel under the Detroit River makes it certain that the project will be carried out, and it is not unlikely that bids for its construction will be asked this summer. The tunnel will connect Detroit, Mich., and Windsor, Canada, and though the building of the tube will not be so great an undertaking as the Pennsylvania tunnels, it will cost several millions of dollars. It will probably be operated by electricity and will be equipped with an adequate system of ventilation, all of which will mean the placing of some nice contracts for power and ventilating machinery, in addition to the large quantity of other mechanical equipment required for the construction of the tunnel.

Another scheme has been brought forward which, if it goes through, will necessitate the purchase of considerable machinery. The Board of Estimate of New York has voted to issue \$750,000 of corporate stock to purify Gowanus Canal in Brooklyn, by digging a 12-foot tunnel from the East River to the head of the canal and by means of a large pumping plant pump enough water into the canal to keep it pure. This is an improvement which ought to be accomplished, as it would not only facilitate shipping, but it would remove a menace to the health of those who live it would remove a menace to the health of those who live or work adjacent to the canal. Commissioner of Public Works Breckenridge has assured the board that the plan is feasible.

Standard Roller Bearing Company Expanding.

S. S. Eveland, vice-president and general manager of 8. S. Eveland, vice-president and general manager of the Standard Roller Bearing Company, Philadelphia, Pa,, has purchased for that company all the machinery, merchandise, assets and good will of the steel ball business of the Federal Mfg. Company, Cleveland, Ohio, which has manufactured steel balls for 15 or 20 years, and which had the largest factory for that purpose in the world. The deal involved the transfer of about 300 machine tools of various descriptions, 5000 small tools and over 100,000,000 steel, has and bronze balls for all sizes such ear are need in hieractical. brass and bronze balls of all sizes, such as are used in bicycles, ball bearings, roller bearings, &c., valued at \$250,000, which were paid for in cash. The Standard Roller Bearing Comwere paid for in cash. The Standard Roller Bearing Company about a year ago bought and transferred to Philadelphia the ball business and machinery of the Grant Ball Company of Cleveland, Ohio, and Franklin, Pa., since which time it has turned out from 4,000,000 to 5,000,000 balls a week. The Federal Company's plant will also be moved to Philadelphia, which will give the Standard Company a capacity of over 500,000,000,000 balls per year. During the past year the company has built and equipped a large addition to its factory in Philadelphia at a cost of over \$300,000. The main factory consists of a building, 150 x 500 feet, and another of three stories, 70 x 260 feet. There is also a large foundry forging and blockswitch obey hards is also a large foundry, forging and blacksmith shop, hardening room, &c., giving a total floor space of over 100,000 square feet. An additional piece of ground, 200 x 300 feet, has recently been purchased, adjoining the factory, upon which another addition will at once be erected to accommodate the machinery purchased from the Federal Mfg. Company. The ball making is directly under the charge of Robert H. Grant, who was formerly manager of the Grant Ball Company, with whom he had 18 years' experience in the manufacturing of steel balls. Thomas J. Heller, who represented the Federal Mfg. Company for a number of years in New York, having entire Company for a number of years in New York, having entire charge of the Eastern business, will continue as manager of the ball sales department. F. M. Germane, who for a number of years had charge of the Western territory for the Federal Mfg. Company, will be Western sales manager for the Standard Company, with headquarters in Chicago, where he will carry a full line of steel balls, roller and ball bearings, &c. At present he will run the Federal ball plant for the Standard Roller Bearing Company until it is moved to Philadelphia in June. Philadelphia in June.

We understand that all differences have been smoothed over, and that the entire contract for the construction of the sand filtration plant at Pittsburgh, Pa., has been awarded to the T. A. Gillespie Company, Pittsburgh and New York. As has been noted, the execution of this work calls for an extensive equipment of machinery, including centrifugal pumps, condensing engines, boilers, mechanical stokers, fuel economizers, a number of machine tools, &c. It is the impression in the trade that the contractors will sublet the contracts for a good part of the machinery, but nothing definite could be learned from the company's offices in this city. All purchases will be made from the head-quarters in Pittsburgh.

in this city. All purchases will be made from the headquarters in Pittsburgh.

The Kilroy Mfg. Company, 302-306 West Fifty-third
street, New York, which was recently incorporated for the
manufacture of self adjusting steam cylinder rings, will
contract the bulk of its work, but will be in the market for
some machinery to take care of the increase in business in
certain departments which it has not been able to satisfactorily contract. The company is now figuring on a plant,
but has not yet decided whether to build a new one or take
over an existing plant. The immediate requirements will
be for lathes from 14 to 54 inch swing, boring mills, drill
presses, milling machines and small tools. For over a year
the company has been demonstrating the advantages of its
rings, which are applicable to all cylinders whether steam,
air, ammonia or gas. Wherever the rings have been installed they are said to have shown an increase of 10 per
cent. in horse-power and an actual decrease in fuel consumption, even in new engines where the builders are observing
the highest practice.

The Weber Piano Company will soon build a sixstory brick factory at 727, 729 and 731 Fourteenth street, New York, at a cost of about \$70,000. The plans include a power plant, and the company will purchase drill presses, boring machines, planers and other machines used in the manufacture of pianos. The list of machines needed has not been made up as yet. Ground has been broken for the factory, which will be erected under the supervision of William J. Fryer of 26 Cortlandt street. It is expected that the structure will be thoroughly equipped before the summer is

out.

The Cambria Steel Company, which is improving its power plant at Johnstown, Pa., has just placed a contract with the Green Fuel Economizer Company, 74 Cortlandt street, New York, for about 2500 horse-power of fuel econo-

The Curtin-Ruggles Company is the style of a new corporation having headquarters at 39 Cortlandt street, New York. The company was organized for the purpose of designing and building slag and Portland cement mills and to engage in the construction of similar plants. The prime movers in the new organization are two well-known cement mill engineers, C. J. Curtin and W. B. Ruggles, both of New York City. Mr. Curtin has been engaged in the manufacture of slag cement and in the designing and construction of mills for its production for the last 14 years. Mr. Ruggles is the senior member of the Ruggles-Coles Engineering Company of New York, which has recently designed and constructed a number of large plants for the manufacture of cement from blast furnace slag. The new company has already begun business with the booking of an important order. It has been retained by the Dominion Iron & Steel Company of Sydney, C. B., to construct and equip a cement plant to have a capacity of 500 barrels per day, taking the slag from the blast furnaces of the Dominion Company. A large portion of the mechanical equipment has already been decided upon by the Curtin-Ruggles Company. This will consist of two Ruggles-Coles dryers, three Prosser tube mills, a 400 horse-power engine to be furnished by the Robb Engineering Company of Amherst, N. S., and two 200 horse-power Robb-Mumford internally fired boilers. The transmission machinery, piping, pumps, tanks, steel elevator casings, &c., still remain to be purchased. The contract for the buildings was awarded to the Dominion Bridge Company of Montreal. T. C. Curtin, formerly superintendent of the Southern Cement Company of Birmingham, Ala., has been engaged to serve as superintendent of the new plant.

The Connellsville Machine & Car Company, Connellsville, Pa., has decided to rebuild on a larger scale its machine shops which were burned about two weeks ago. The concern will require considerable iron working tools in the equipment of these new shops.

The Humacao Sugar Company is preparing to erect a large sugar producing plant at Humacao, Porto Rico, and has purchased a large order of machinery from the Pioneer Iron Works of Brooklyn. The list includes four 125 horse-nower boilers, an engine, crushers and quadruple effects. The company will produce 100 tons of sugar a day and 1000 acres of cane has already been planted. A contract has been placed with the Pioneer Iron Works for a steel building 125 x 175 feet and a boiler house 75 x 100 feet. The contract for erecting the plant has been awarded to the Porto Rico Engineering Company, and it is expected that all the machinery will be installed between December and February next. In addition to constructing the plant the company

will install 5 miles of railroad of 3-foot gauge with 25-pound rails. An order for flat cars has been placed with the Gregg Company of Newburg, N. Y. The Humacao Company has its offices at 65 Wall street, and William L. Bass has had charge of the purphesipe.

charge of the purchasing.

The Tezuitlan Copper Mining & Smelting Company has been organized by the men who control the Compania Metallurgia Mexicana, with a capital of \$10,000,000. The company has a New Jersey charter, and will engage in copper mining and smelting near Tezuitlan, Puebla, Mexico. The company has awarded some contracts for machinery for mining and smelting.

company has awarded some contracts for machinery for mining and smelting.

The Adams Express Company has plans for a power plant in the upper part of New York City, and within the next 60 days G. A. Wells, chief engineer of the company, who has offices at 59 Broadway, will purchase machinery for a complete power house equipment.

Col. W. C. Greene, president of the Greene Gold-Silver Company, is in Mexico, where he is inspecting several properties, which the company recently acquired. It is the in-

Col. W. C. Greene, president of the Greene Gold-Silver Company, is in Mexico, where he is inspecting several properties which the company recently acquired. It is the intention of the company to build several smelters and mining plants in Mexico during the present summer, and Colonel Greene is there with a number of experts with a view to discovering what the prospects are for mining gold and copper on the properties the company owns. Frank Klepetko, who has offices in the Battery Park Building, is representing the company in some of its prospective construction operations.

Business Changes.

The Wellman-Seaver-Morgan Company, with main office and works at Cleveland, Ohio, announces that Geo. B. Damon, who has been manager of its New York office, has been transferred to an important position in connection with the engineering and sales department at Cleveland, Ohio, and that W. A. Stadelman, for the past ten years manager of the Eastern office of the Brown Hoisting Machinery Company, has been appointed manager of the general Eastern office, at 42 Broadway, New York. Mr. Stadelman is well and widely known from his connection with the Sprague Electric & Railway Motor Company, as chief engineer of the Equitable Electric Railway Construction Company, general manager of the Bristol Belt Line Railway Company, and latterly in his connection with the Brown Company.

Richard Devens, formerly sales manager of the Brown Hoisting Machinery Company, at Cleveland, Ohio, has been made manager of the Eastern office at 26 Cortlandt street. New York.

New England Machinery Market.

WORCESTER, MASS., April 4, 1905.

The demand for machine tools is on the rise again. The manufacturers have received goodly orders during the past week, and it looks as if the expected had happened with the turn of the weather. Manufacturing generally is looking up and the machine tool and kindred lines are not behind. The feeling expressed on every side is very different from what it was last week. Large orders have been booked by most of the machine tool builders. The chuck manufacturers and others who make appurtenances of the machine shop are very busy indeed.

Foreign trade is brisk. The Japanese orders are pretty well cleared up. They were a boon to the trade while they lasted and netted large margins of profit, so that the gap in the demand which light domestic trade would have created was well bridged. Now the normal foreign demand—that is, the demand from manufacturers abroad, and especially from the agents in England and on the Continent, has increased. The tendency on the part of foreign customers is to want quick delivery. Cable inquiries and orders are unusually abundant.

But the most encouraging sign is the demand from American customers. There is no boom. The condition will probably prove to be beter than a boom, because it will possess nothing of the abnormal and will consequently be more apt to be enduring.

The demand for boilers is growing, and the discouragement which the boiler makers expressed within a fortnight is disappearing with the closing of contracts, most of them small but on the whole pretty good

mall, but on the whole pretty good.

The Robb-Mumford Boiler Company has purchased the good will and complete equipment of Edward Kendall & Sons, Cambridge, Mass., manufacturers of boilers. The Kendall plant, which is also known as the Charles River Iron Works, is one of the most important and best known of the boiler manufacturing establishments of New England. It was founded more than half a century ago by Edward Kendall, and of recent years his two sons, George F. and James H. Kendall, have been associated in the management. The Kendall family will disappear from the business. The purchase does not include the real estate, but everything else is included. The equipment will be moved to South Framingham. Mass., where the Robb-Mumford Company is building new works, which will be ready for

occupancy in about three months. The Robb-Mumford Boiler Company is an offshoot of the Robb Engineering Company, Amherst, Nova Scotia. The interests of the two companies are practically identical, but the two corporations will be conducted entirely independently of one another. The Robb Engineering Company has been manufacturing the Robb-Mumford internally fired tubular boiler for about ten years, and will continue the line for the Canadian trade, while the new company will devote its energies to the United States. In addition the company will build steel stacks, tanks, and do other sheet metal work, which has been part of the business of Edward Kendall & Sons, including the tubular boiler which they have been building for years past.

The South Framingham plant, already mentioned in these columns, will consist of a main building, 150 x 300 feet, and a storehouse and pattern shop, 90 x 100 feet. In addition there will be an office building. The contract for the steel has been let to H. P. Converse & Co., Boston, and a part of the material is expected to be on the ground within a week. Work on the new buildings will be rushed to completion, that they may be occupied as soon as possible. In the meantime the business will be carried on at the Charles River Iron Works, where considerable orders are under way. The news of this transaction will not be welcomed in the Boston machinery market. The Robb-Mumford Company had out a long list of tools which were needed to equip the new works, and dealers had submitted figures. The equipment acquired from Kendall & Sons will replace most of the tools that were to be purchased. A few heavy tools will be required later. This list is not ready, and will not be ready for some time. Electric cranes have been ordered from the Northern Engineering Works, Detroit, one of 25 tons capacity with 5-ton auxiliary hoist, the other of 5 tons. An Ames engine has been purchased, and a 100-kw. General Electric generator.

The officers of the Robb-Mumford Company are: Presi-

The officers of the Robb-Mumford Company are: President, D. W. Robb, Amherst, Nova Scotia, who is the managing director of the Robb Engineering Company; secretary and treasurer, G. W. Cole, Amherst, who holds the same offices in the Robb Company, and general manager, F. H. Keyes. J. A. Mumford, New York, inventor of the Robb-Mumford boiler, will be the consulting engineer; J. J. Wilde, superintendent of the Kendall works, will hold the same position with the new company.

The Malleable Iron Works, New Britain, Conn., is to build an extension to its foundry, to be 55 x 80 feet, and one story. A hand power traveling crane and an air furnace for making malleable iron will be installed.

The Carlyle Johnson Marchine Company, Hartford,

The Carlyle Johnson Marchine Company, Hartford, Conn., manufacturer of clutches, has taken another floor in the building occupied by it on Asylum street, affording 3500 square feet additional floor area, which doubles the manufacturing capacity.

The Henry & Wright Machine Company, Hartford, Conn., manufacturer of high speed sensitive drill presses, has taken additional space in its building, more than doubling its capacity. The new part of the shop is 40 x 125 feet, and in addition there is a new office. The old office will be converted into a drafting room.

will be converted into a drafting room.

The Simonds Mfg. Company, Fitchburg, Mass., manufacturer of saws, will make a large addition to its Fitchburg plant. Three new buildings will be built. One will be 60 x 175 feet and four stories, another 40 x 120 feet and four stories, and the third, a blacksmith shop, will be 40 x 100 feet and one story. The buildings will be of brick and wood and heavy mill construction. The plant will be equipped with electrical power transmission and generators and motors will be required in addition to other machinery.

The Vermont Spool & Bobbin Company, Essex Junction, Vt., will remove its business to Burlington, Vt., where a new factory, 50 x 150 feet and two stories, will be built. No new machinery will be needed at present. The company has recently increased its capital stock from \$15,000 to \$60,000.

The Randolph-Clowes Company, Waterbury, Conn., manufacturer of brass goods, is to erect a one-story brick building, 28 x 108 feet, and one story, for a casting shop.

ing, 28 x 108 feet, and one story, for a casting shop.

The Colonial Foundry & Machine Company, South Norwalk, Conn., is to add considerably to its capacity by an addition to its foundry molding room, 55 x 85 feet. The building will contain the sand bins and new core ovens and the old ovens will be moved from their present position to the addition, which will afford much more molding room. Another new building will be 68 feet square and will be used for a cleaning room, and the present cleaning room will be devoted to storage. No new equipment will be needed for the present.

present.

The William H. Page Boiler Company, Norwich, Conn., manufacturer of steam and hot water boilers and radiators, will erect a new building, 18 x 120 feet, principally for storage purposes.

age purposes.

Twitchell & Robinson, Patten, Maine, are to build a 40-foot addition to their shop and will need a gasoline engine, band saw, rip saw, planer and lathes, both for wood and metal. The company will manufacture heavy wagons and do a general woodworking business.

The Marlin Fire Arms Company, New Haven, Conn., is to increase its plant by the erection of a four-story building, 35 x 69 feet. It will be devoted to several departments, including assembling inspection, packing and shipping.

35 x 69 feet. It will be devoted to several departments, including assembling, inspection, packing and shipping.

The Royal Equipment Company, Bridgeport, Conn., manufacturer of automobile brakes and gasoline engines, has removed from its quarters at 57 Golden Hill street to a more commodious plant at 165 Housatonic avenue. The change will afford four times the manufacturing space of the old shop. The company reports that it is very busy, especially on orders for automobile brakes.

Chicago Machinery Market.

CHICAGO, ILL., April 4, 1905.

A comprehensive canvass among machinery dealers indicates that present business is light, but that what business is done is on a basis that leaves a satisfactory profit margin. In other words, neither makers nor sellers are disposed to force business at the expense of profits. While there is a fair amount of correspondence coming in from out of town, the number of people visiting the warehouses and showrooms of the machinery sellers is relatively small and store salesmen are unemployed a good part of the time. Traveling salesmen from the road are sending in a rather good volume of business, indicating that the local lull in demand seems to be confined to Chicago. Possibly the stirring mayoralty campaign has something to do with the stagnation of business locally. The point at issue in to-day's election is whether or not the city of Chicago shall take over and operate the existing street railway lines, and until that question is decided there will necessarily be a cessation of purchases on the part of the street railway interests, and many other interests are awaiting the outcome of the election. A similar letup in buying is very noticeable with machinists' supply companies, who sell miscellaneous supplies other than machinery, and with them business is not as good as it was a year ago, buyers in the city evidently confining their purchases to daily requirements in small quantities. Similarly also the machinists' supply companies find a better business in the country than they do in the city. Boiler shops as a rule are very well filled with business, and one noteworthy feature in the demand for boilers and engines to-day is the erection of central power, lighting and heating plants all over the country. Investors have found as a rule that plants of this kind make money, particularly where they are run in connection with an electric railway line, and the economic advantage of making power in large quantities and selling it to small consumers in the same town in small quantities has become daily more manifest. The

Machinery Requirements.

Bids are now being taken on the machinery equipment of the Chas. Netcher building, commonly known as the Boston Store. The machinery requirements are very large and the mechanical equipment of this new plant will embody many novel and interesting features. In the first place, the engine and boiler room is 42 feet below the street level and on the level of the tracks of the Illinois Tunnel Company, switch tracks of the tunnel line running through the boiler room, thus serving the plant with coal taken direct from the coal docks or freight yards. The lighting plant will include three 300-kw., one 200-kw. and one 100-kw. units, consisting of engine and dynamo. The ventilating system will call for 100 horse-power in engines, generators and fans. For fire protection, two 1000-gallon pumps will be required, while for house service two electrical triple-expansion pumps 6 x 8, will be purchased. The pneumatic tube system will require an engine and a compressor or blower of about 160 horse-power. The vacuum system has the preference over a compressed air system. The refrigerating system, which will be connected up with the ventilating system, in place of the heating plant in summer, will involve 80 horse-power. Figures are being taken both on the basis of ammonia refrigerating machines and liquide carbon dioxide. There will be 28 passenger elevators and six freight hoists, the elevator plant requiring an aggregate of more than 500 horse-power in engines. Whether a hydraulic or electric elevator service will be installed is not yet definitely decided. One of these elevators, with 10 x 24 foot floor, will be worked in direct conjunction with the Tunnel Company's car service, so that tunnel cars full of freight arriving at the basement of the building will be switched directly on to the elevator and hoisted to whatever floor its load is destined for, stub tracks on the floor permitting the switching on to the floor from the elevator. To furnish power for all this equipment figures will soon be asked for a battery of water

system, which will provide movable stairways for the convenience of customers connecting all the floors from the basement to the fourth floor. The building itself is to be ten stories in hight and built in six sections. Work is to commence immediately. Holabird & Roche, Chicago, are the architects, who will let the machinery contracts above referred to, while the George A. Fuller Company has the general contract for the erection of the building.

The Illinois Central Railroad is expending several million dollars in rebuilding the burned terminal facilities at New

dollars in rebuilding the burned terminal facilities at New Orleans. It has already been decided to build 3000 feet of wharf, covered with a steel shed and supported with steel columns; two freight warehouses, one of which is 100 x 1000 feet, and the other 100 x 1200 feet. These buildings have brick walls, concrete floors and steel columns and roofs and are fire proof. A cotton warehouse, 100 x 1600 feet, will also be built in the same manner of construction. Two grain elevators are to be erected, for one of which, with a capacity of 1,500,000 bushels, contracts have already been let. This will be a wooden building. No new power will be required for this elevator, because the old power house was not destroyed. Definite decision has not been reached with reference to the

Definite decision has not been reached with reference to the other elevator. Steel conveyors will connect the elevators with the wharf. These conveyors will be 3500 feet long, supported on steel columns. The matter is in charge of R. E. Gaut, superintendent of bridges and buildings, Chicago. Winslow Brothers Company, Chicago, maker of ornamental iron work, will build a new plant to cost about \$200,000, as referred to in these columns previously. The general contract for erecting the buildings was placed with the Wm. Adams Company, 145 La Salle street. The P. Nacey Company, Chicago, has the plumbing contract. Heating, power and machinery contracts have not yet been

Nacey Company, Chicago, has the plumbing contract. Heating, power and machinery contracts have not yet been awarded and are in the hands of Mr. Winslow personally. Raeder & Coffin are the architects. A radial brick stack, 100 x 5 feet for this plant has been awarded to M. W. Kellogg Company, New York.

The United States Gypsum Company, which has a chain of 35 plants in the United States, has purchased a tract of land, 300 x 500 feet, at Robey street, the Burlington tracks and Slip D of the south branch of the Chicago & Northwestern Railroad, Chicago. The company will expend \$100, and Shp D of the south branch of the Chicago & Notice western Railroad, Chicago. The company will expend \$100,-000 in the erection of a plant for the manufacture of plaster products, together with warehouse and docks, giving it a capacity of 500 tons daily. Chicago offices are at 200 Monroe street.

B. F. Barnes Company, Rockford, Ill., is adding an 80 x 100 foot building to its present plant, the increased space being necessary to accommodate the growth of its business

in drills and machine tools.

The Michigan Cold Storage & Transfer Company, Benton Harbor, Mich., is erecting a cold storage warehouse to cost \$200,000. Westerlin & Campbell, 53 South Clinton plant for this warehouse, which will involve 250 horse-power in boilers and ammonia refrigerating machinery. It is the plan of the company to manufacture electric light and sell it to the city of Benton Harbor, and to erect wharves in con-

nection with its warehouse.

The Ebner Milling Company, Wadena, Minn., will build a 10,000-bushel steel circular elevator, and may build two.

Prices and specifications are desired.

Figures are being taken by the Federal Improvement.

Company, Roanoke Building, Chicago, for the erection of an electric motor hoist and ash conveyor in one of the plants of the Glucose Sugar Refining Company.

The Lamson Consolidated Store Service Company of Boston, Chicago office 200 Monroe street, has been awarded

contract for the auxiliary mail conveyor system for the new Chicago post office. The contract price is stated to be Chicago post office. \$84,771.

Municipal and Power Work.

One of the largest water power projects that has some One of the largest water power projects that has some promise of going beyond the paper stage is a plan to build a 35-foot dam across the Mississippi River at the foot of the rapids at Keokuk, the dam connecting the towns of Keokuk, Iowa, and Hamilton, Ill. This project is in the hands of the Keokuk-Hamilton Water Power Development Company and Lyman E. Cooley of Chicago is consulting engineer. A dam of this hight would back water about 40 miles, or about up to the city of Bloomington, and with turbines and cover houses at either end of the dam would develop about about up to the city of Bloomington, and with turbines and power houses at either end of the dam would develop about 60,000 horse-power at low water, and 110,000 horse-power or more at high water. The dam would be between 5000 and 7000 feet long, depending upon the decision of the engineer of the War Department, who, by virtue of his office, has the right of dictating plans. One of the stipulations in the franchise already given by Congress is that the company shall rebuild a water power canal about 7 miles long around its dam and that it shall provide a suitable lock at the center of the dam. It is estimated that the cost of this plant will be not less than \$3,000,000 and may run up to \$6,000,000. Congress has passed an enabling act making the company, however, work according to plans laid down by the War Department, and as soon as an understanding has been reached between the company and the War Department

active steps will be taken to underwrite the proposition. It is estimated that there is an immediate demand for about 20,000 horse-power in the vicinity of this proposed dam and markets can be created for the balance of the power by selling power at so low a price as to invite industries from all over the United States to locate at either end of the

The village of West Allis, Wis., held a special election March 26, at which it was voted to issue bonds to the amount of \$60,000, to be used in the construction of a water works system to be connected with the water works system of the city of Milwaukee. This means that the new plant of the Allis-Chalmers Company, as well as other industries located at West Allis, will be given the benefit of the Milwaukee water works system. The city of Milwaukee will extend its high pressure water mains to West Allis at a cost of about \$15,000. Owing to the hight of West Allis above the lake level, 150 feet, it will be necessary to install a pumping station near the eastern limits of the village, equipped with pumps in duplicate, and to build a steel tower and 100,000-gallon tank. Except in case of fire, however, it will be a steel to the control of the con it will not be necessary to pump the water, as the pressure from the city main will be sufficient for ordinary purposes. The system proposed includes the laying of over 7 miles of water mains and 58 fire hydrants, shut off gates and valves. Connection with the city mains will be made at Arnauld and National avenues at the new shops of Pawling & Harnischfeger, which will also come in for the additional fire protection.

Contracts for the water works machinery for Bradley,

Contracts for the water works machinery for Bradley, Ill., were let March 29 as follows: Pumps to the Goulds Mfg. Company, Seneca Falls, N. Y.; gas engine, Fairbanks, Morse & Co., Chicago, and stand pipe, Aurora Boiler Works, Aurora, Ill.

D. H. Burnham & Co., Chicago, are preparing plans for D. H. Burnham & Co., Chicago, are preparing plans for a ten-story fire proof business building, 105 x 120 feet, for Marshall Field, at Fifth avenue and Polk street, Chicago. The structure will be occupied by a large paper manufacturer and dealer, together with other tenants.

F. B. Abbot, architect, has removed from 225 Dearborn street, Chicago, to 651-2 First National Bank building. Mr. Abbot is building large additions to the plant of the Elgin National Watch Company at Elgin, Ill.

Philadelphia Machinery Market.

PHILADELPHIA, PA., April 4, 1905.

There has been no marked change in the condition of the machinery trade the past week. A fair day to day busi-ness has been done, confined mostly to single or small lots of tools, nothing in the way of large deals being transacted. In fact dealers have found the demand a little quiet, par-In fact dealers have found the demand a little quiet, particularly so far as orders on immediate inquiries are concerned. Inquiries nevertheless are coming along quite freely, but do not always lead up to business as promptly as might be desired. Most of the business closed has been more of the nature of deferred purchases, some of which have been hanging fire for as long as six months. Manufacturers have booked more orders and plants generally are becoming more busy. This is particularly noticeable among the builders of heavy tools and special heavy machinery, although some of the builders of small tools have also taken on a nice lot of work. Deliveries on some lines of tools and on a nice lot of work. Deliveries on some lines of tools and certain sizes of others are becoming quite extended; in some cases it is not possible for manufacturers to promise ship-ments for from three to four months. The smaller tools now being purchased cover a wide range, both as to size and class, and some of those making this class of tools have their plants operating to the limit of their capacity. The foreign demand appears to have dropped off; here and there a few orders are being taken for export but the aggregate few orders are being taken for export, but the aggregate

quantity is not large.

Foundries are being taken for export, but the aggregate quantity is not large.

Foundries are becoming more active every day. Besides the additional business being placed by machinery and tool builders, the shipyards and railroads are placing more orders for both iron and steel castings, while the opening weather has brought further orders from the building and other out-

door trades.

The railroads are still slow in making their requirements known for tools in quantity for the present year. Small orders for replacement and for minor additions are being placed, and some large business is expected from these sources before very long. All in all, the trade takes considerable encouragement out of the general conditions and looks forward to some very satisfactory business before a great while. great while.

Industrial Notes.

The Crane Company is taking estimates for a new store, warehouse and shop to be erected at American and Master streets. The building is to be of brick, four stories in hight and thoroughly fire proof. The contract is expected to be let early in the spring.

The city of Philadelphia will shortly be in the market

for an equipment of machine tools of various kinds, to be installed in the new Northeast Manual Training School, the building of which is just about completed. City councils will be asked to appropriate \$50,000 for the purchasing of these tools, and it is expected that bids will be asked at an early date.

arly date.

The Carver File Company, a recently formed corporation, is erecting a new file making plant at Frankford and Allegheny avenues. The buildings, which are of brick, and of slow burning construction type, are 200 x 70 feet and two stories high. A 300 horse-power boiler and a 200 horse-power engine have been purchased to furnish power for the plant. The designs for the shafting are in course of preparation, while the purchases of file making and other maaration, while the purchases of file making and other ma-

chinery have not yet been made.

The Philadelphia Roll & Machine Company has during the past week melted an exceptionally large tonnage, 500 tons of charcoal iron being cast almost entirely into sand and chilled rolls. Inquiries have been very satisfactory and orders numerous. The improvements to the plant, mention of which was recently made in these columns, have been started and will be pushed to early completion.

The Tabor Mfg. Company, manufacturer of the Taylor-Newbold cold saws, reports a very satisfactory business during the past month. Inquiries for these saws have been large and a good volume of orders have been placed on the books. It is now preparing to increase its capacity so as to enable it to make saws up to 60 inches in diameter. Some machinery has already been purchased, but the company is still in the market for grinding machinery. Shipments of saws have recently been large, including many duplicate orders from parties already using its tools.

Car and Locomotive Work.

The J. G. Brill Company has recently made a contract to construct 200 electric cars of the latest type for the Chicago City Railway, Chicago, Ill. This is a rush order and the work will be divided between the Elizabeth, N. J.; Cleveland, Ohio; St. Louis, Mo., and the local shops, each building 50 cars. All departments of the local plant are being operated to their fullest capacity and sufficient orders are in hand to keep them occupied for a number of months. This company has recently made arrangements to ship 15 electric cars of the convertible type to Manila, P. I., for the local railway line at that point.

The Baldwin Locomotive Works made a record output of locomotives during the month of March, a total of 257 engines being completed. Of these 226 were new, the remaining 31 being engines which had been practically rebuilt. Two hun-Two hundred and sixteen locomotives were shipped during the same month, which is also a high record for deliveries. This pro-portion of output based on the year makes the productive capacity of the works on its present basis equal to 2712 engines per year. The number of employees required to produce this month's output was 14,500, which is less than was required to produce a much smaller number of locomotives during 1903. Business continues with the Baldwin Company on a very satisfactory basis. Inquiries are numerous and a number of good orders have been placed on its books. Deliveries during the month include shipments to the Southern Pacific Railway, Pennsylvania Railroad, Cincinnati, Hamilton & Dayton and the various Harriman lines. An order for 27 locomotives was completed for the Atlantic Coast Line, while 25 were completed for the Central Georgia Railway. Railway.

Cincinnati Machinery Market.

CINCINNATI, OHIO, April 4, 1905.

Trade still continues good in machinery circles and the Perhaps the most general appearance is one of prosperity. noticeable feature is the continued growth in foreign inquiry, which bids fair to outstrip previous records, at least for a year or two past. This demand does not appear to be conyear or two past. fined to any particular section or country, but is general in its character and fairly well distributed. Japanese orders, which for the past few months have been an important facwhich for the past few months have been an important factor of trade and was the cause of large reduction in the stock of manufacturers in this city, have all been filled and forwarded. One or two of the plants are contemplating increasing their facilities and adding to their floor space and expect soon to begin the work of building.

The meeting of the National Machine Tool Builders' Association at Washington on the 11th of the month is expected to the formula of the trade.

pected to be of considerable interest to the trade. A number of members from this city will be present and take part in the proceedings. President William Lodge and Secretary

Montanus have been in conference during the week and have about arranged all details for the meeting.

Mention was made in our letter of last week that it was feared that a strike would result among the structural iron workers as a result of the employers refusing to accede to the demands of the men. These laborers are divided into two classes, the outside and inside men. Union No. 44 represents the outside men, engaged in the hazardous work on large buildings and bridges, who have been receiving from 30 to 40 cents per hour and now demand from 50 to $57\frac{1}{2}$ cents per hour. They have been working nine hours per day and want this reduced to eight hours for a day's work. Union No. 47 represents the inside workers, or shop men, who have been receiving from $18\frac{1}{2}$ to 33 1-3 cents per hour for nine hours' work, and now demand $37\frac{1}{2}$ cents, maximum, eight hours to constitute a day's work. eight hours to constitute a day's work. On Sunday the men held a large mass meeting and requested to meet the employers at ten o'clock Monday, in order to try and arrange their differences. At the meeting held to-day the committee representing the Iron League agreed to renew last year's agreement and send it in writing to the workers. This will be presented at a meeting to be held this evening, and in the event of not meeting with the favor of the men a strike will be called of both branches. The following firms compose the Iron League: The L. Schreiber & Sons Company, pose the Iron League: The L. Schreiber & Sons Company, Walton Iron Company, Ig. Grimm & Co., Columbia Iron Works, Covington Architectural Company, Stewart Company, Potthoff & Frey Company, John H. Schumacher and W. E. Ward Company. A strike at this time would be of most serious consequence and cause much expense and delay in the erection of the many large buildings that are now being constructed, among which is the new water works plant now about ready to receive its iron work.

The Sebastian Lathe Company says that it is very busy and that it has orders booked for some time ahead. Foreign demand is strong and is a very important part of the trade.

demand is strong and is a very important part of the trade. The company is to-day shipping four large size 15-inch lathes to Japan and filled an order for one of the same size that went forward last week.

Cincinnati Milling Machine Company The Cincinnati Milling Machine Company has commenced the erection of a one-story shop building, 120 x 130 feet, to be used in connection with the other buildings. Trade has increased to such an extent that it has found it imperative to make this addition in order to secure enough room to accommodate the growing business. Everything in a business way is said to be very satisfactory and the company is having all it can do. Fred. A. Geier, president, was recently elected vice-president of the National Metal Trades Association at its meeting in Chicago.

The Lodge & Shipley Machine Tool Company advises that the past month was a large one as to volume of business handled, and trade generally is in a very satisfactory condition.

The Bickford Drill & Tool Company is changing and re-designing several of its tools and expects to add to the line before very long. The company reports business, both for-eign and domestic, on the increase and prospects bright for a

Schumacher & Boye say they have no cause for complaint, and that the markets where they seek trade have proven very satisfactory. Foreign demand is much heavier, while inquiry from points in this country has increased several

fold.

The Bradford Machine Tool Company is apparently having a fair share of trade in the lathe line that is being received in this city. While home consumption is very sat-

and on the increase.

The R. K. Le Blond Machine Tool Company continues busy, and reports that the month of March proved to be a good month so far as sales were concerned. It has a number of medium orders booked for early delivery and expects a good year.

The American Tool Works Company advises that everything is running smoothly and that it is very busy in all departments. Considerable inquiry from foreign sources is being received, and conditions are exceptionally bright for

The L. Schreiber & Sons Company is doing considerable estimating in the structural line, and has several large contracts under way both in the city and out. The attitude of the workers at this time plays a very important part in its calculations, and it is hoped that a satisfactory settlement will be made and an agreement be reached that will redound to the benefit of all concerned.

On April 17 F. S. Cadwell, who was formerly with the

S. Obermayer Foundry Company, will open an office in this city as Western sales agent for the Asbury Graphite Company, which owns mines in Ceylon. Mr. Cadwell has been long identified with the foundry supply business, and is well and favorably known. He has not as yet definitely decided

on a location.

The D. T. Williams Company is gradually getting its shop in condition and is receiving new tools every few days. In addition to the equipment mentioned in these columns several weeks since the company has purchased several more Lodge & Shipley lathes and several other tools from out of town points. It has had in contemplation the purchase of the building that immediately adjoins its plant on the south, but is unable to secure same. In addition to the regular line it has the agency for the Packard and Columbia makes of automobiles, which trade is said to be good.

The United Foundry Company, a new concern. with \$25,000 capital, was incorporated last week by John W.

Molloy, Henry W. Mueller, Frank Grieme, George Liable and Chris. Hasecoster. It will do business in this city. The \$50,000 plant that is occupied by G. A. Gray & Co.

at the northwest corner of Gest and Depot streets, this city, was formally transferred to that company by the Iron Castings Company. The property is 200 x 200 feet, with a large factory building on same occupied by the Gray Company in the manufacture of tools.

Cleveland Machinery Market.

CLEVELAND, OHIO, April 4, 1905.

The Riester & Thesmacher Company, Cleveland, manufacturer of sheet metal work, stampings, hardware specialties, &c., which heretofore has operated three factories, has purchased a large building at the corner of Pearl and Church streets, Cleveland, and is remodeling the building and will consolidate its business at that point. It is in-stalling a 150 horse-power engine and boiler and will replace some of its present equipment with heavier tools, including presses, lathes, &c.

The company which has acquired the plant of the Standard Motive Power Company at Canal Dover, Ohio, referred to in the last issue of The Iron Age, will be known as the Bechtold Crucible Steel Company of Cleveland, capitalized at \$500,000, and incorporated under the laws of Delaware. Officers of the company are as follows: W. L. Bechtold, president and general manager; F. B. McCroskey, vice-president, and W. E. Flanders, secretary-treasurer.

The plant of the Hussey Drop Forge & Mfg. Company on Axtel street, Cleveland, was damaged by fire to the amount of about \$30,000 last week. The buildings of the machine and forge shops were damaged, but the machinery was not seriously injured; so that it is probable that no new machinery will have to be installed. Work of rebuilding is under way. The company had just completed in-The company which has acquired the plant of the Stand-

new machinery will have to be installed. Work of rebuilding is under way. The company had just completed installing considerable forging machinery, including a 600-pound Lane hammer, a 2000-pound Bement-Miles hammer and a 2500-pound Alliance Machine Company's hammer. The company is figuring on installing a 1000-pound steam ham-

mer.

The Cook Motor Company, Delaware, Ohio, is erecting an addition, 32 x 100 feet. It has purchased about all the additional machinery that will be required. The company manufactures gas engines up to 12 horse-power, designed for

manufactures gas engines up to 12 horse-power, designed for lighting purposes.

The Plymouth Mfg. Company, Plymouth, Ohio, manufacturer of brass castings, cream separators and hardware specialties, has under consideration the erection of a new factory building on the Erie Railway near Plymouth.

The Niles Fire Brick Company, Niles, Ohio, is preparing to improve its plant at a cost of \$100,000. The improvement of the provential include sight below the light of the cost and focus being the cost of the cost of \$100,000.

ments will include eight kilns, drying room and floors, boiler house, engine house and machinery room. Most of the equipment has already been purchased.

The Bird Iron Company, Ironton, Ohio, informs us that it has purchased the property heretofore known as the Lawrence Furnace, Lawrence County, Ohio. The company will improve this property by building an entire new stack, together with one additional hot blast stove, two boilers, two engines, hoist tower and cast house, and when completed it will be a modern plant of about 150 tons capacity. The property consists of 400 acres of land, with coal, ore and limestone on same; also about 50 houses for workmen, a storeroom, barns, &c. It is situated at the junction of the Detroit Southern and Cincinnati, Hamilton & Dayton railroads, 10 miles north of Ironton.

A company to be known as the Imperial Steel Company will take over the properties of the Coxey Steel & Silica Sand Company at Mt. Vernon, Ohio, and will make steel and iron castings. The property consists of a large and well equipped steel castings plant erected by Gen. John S. Coxey. Officers of the new company have not yet been elected.

Power Plant Equipment.

The Cleveland Electric Railway Company of Cleveland is preparing to make important improvements at its Viaduct power station, which furnishes current for about half the street railway systems in that city. A contract has been placed with the Allis-Chalmers Company for a horizontal cross compound condensing engine rated at 2000 horse-power cross compound condensing engine rated at 2000 horse-power and for a Westinghouse direct current railway generator of 1500 kw. capacity. An addition large enough for two units this size will be erected and it is probable that a contract for a similar unit will be placed in a few months. Contracts have not yet been closed for boilers, stokers, condensers, piping or auxiliary equipment. E. J. Cook is chief engineer of the computer.

of the company.

The Board of Managers of the State Reformatory Mansfield, Ohio, will receive proposals until April 19 for furnishing and erecting four 265 horse-power water tube boilers and four complete automatic stokers for same. Plans and specifications have been prepared by Henry Heer, mechanical engineer, Ohio State Reformatory, Mansfield Ohio.

Government Purchases.

Washington, D. C., April 4, 1905.

One of the most interesting developments in connection One of the most interesting developments in connection with the building of the Panama Canal was the reconstruction of the Isthmian Canal Commission by President Roosevelt. The new commission consists of Theodore P. Shonts, Charles Magoon, John F. Wallace, Rear-Admiral M. T. Endicott, Gen. Peter C. Hains, Col. Oswald M. Ernst and Benjamin M. Harrod. Messrs. Shonts, Magoon and Wallace will compose the Executive Committee.

It is the intention hereafter of the Isthmian Canal Commission to send out specifications and ask for bids for almost all of the material that it will require for building the Panama Canal. The commission is now asking bids until May 1 for a quantity of machinery, including drills,

until May 1 for a quantity of machinery, including drills, lathes, tools, saws, steam hammers, boring mills, planers, pneumatic machinery, &c. It is also asking bids until May 3 for steam shovels, the specifications for which have not as yet been sent out. Bids will soon be asked for a large amount of supplies, including 24 diaphram pumps and six Buffalo forges, 18-inch hearth.

Buffalo forges, 18-inch hearth.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 18 for a quantity of supplies for the Portsmouth, Boston, Newport, New York, League Island, Washington and Norfolk navy yards, including motors, rivet forges, heaters, &c.

The Bureau of Yards and Docks, Navy Department, Washington, will soon ask bids for furnishing two traveling cableways for the naval station at Guantanamo, Cuba, for use in excavating for the dry dock to be constructed at that

use in excavating for the dry dock to be constructed at that

station.

Two orders were recently placed with American firms for machinery to be used in digging the Panama Canal. The Panama Canal Commission which resigned last week closed a contract with the Ingersoll-Sergeant Drill Company, New York, for 50 standard rock drills. The machines are to be used in the removal of rock in the great Culebra Cut through the crest of the isthmus. The commission also authorized the Ingersoll-Sergeant Company to remodel a large number of the French-Ingersoll drills already in use at the canal operations. These machines were built in France under the patents of the American manufacturer and they remain from the equipment of the French company, whose operations on the canal ended so dismally.

The Rand Drill Company, New York, has received an order for 50 drills, complete with mounting and equipments, to be delivered as early as possible. It is said in the trade

to be delivered as early as possible. It is said in the trade that the new commission will place orders for nearly 1000 drills with American manufacturers during the coming summer, as it is declared that fully that many will be required to cut through the rock formation at the crest of the

All bids opened by the Isthmian Canal Commission on February 28 for 25 rock drills have been rejected. It is probable that new bids will be called for under another date under revised specifications.

The following bids were opened March 25 for a 20-ton four motor electric traveling crane for the Portsmouth Navy

The Morgan Engineering Company, Alliance, Ohio, item

The Wellman-Seaver-Morgan Company, Cleveland, Ohio, item 1, \$6840. The North Penn Iron Company, Philadelphia, Pa., item

1. \$4120. Northern Engineering Works, Detroit, Mich., item 1,

\$5925; 2, \$5100. Manning, Maxwell & Moore, New York, item 1, \$5212. Pawling & Harnischfeger, Milwaukee, Wis., item 1, \$4650.

Cleveland Crane & Car Company, Wickliffe, Ohio, item 1, \$6100; 2, \$4950. Whiting Foundry Equipment Company, Harvey, Ill.,

item 1, \$4890.

The Case Mfg. Company, Columbus, Ohio, item 1, \$4450.

Niles-Bement-Pond Company, New York, item 1, \$6060; 2. \$5000.

The following bids were opened March 28 for supplies for the Mare Island Navy Yard: Bidder 30, Cleveland Punch & Shear Works, Cleveland, Ohio; 36, Ely Machinery Company, San Francisco, Cal.; 54, Harron, Rickard & McCone, San Francisco, Cal.; 56, Henshaw-Bulkley Company, San Francisco, Cal.; 85, Niles-Bement-Pond Company, New York; 87, New Duty Mfg. Company, Janesville, Wis.; 92, Henry Pels & Co., New York; 112, Tatum & Bowen, San Francisco, Cal.

Schedule 96.

Class 10. One 14-inch sand belt machine, motor driven-Bidder 56, \$630.

Class 11. Three Universal tilting table arbor saw benches, motor driven—Bidder 36, \$1494; 54, \$2292; 112, \$1785.

Class 12. One double ended punch—Bidder 30, \$2705;

 $54,\,\$3619\,;\,56,\,\3270 and $\$3320\,;\,85,\,\$4200\,;\,87,\,\$3900\,;\,92,\,\$3100\,;\,112,\,\$3153.40.$

Under bids opened March 14 for machine tools for the various navy yards, under schedule 84, the J. A. Fay & Egan Company, Cincinnati, Ohio, has been awarded class 3, one power feed rod machine, \$259; Drew Machinery Agency, Manchester, N. H., class 4, one wood lathe, \$94.50.

Southern Supply and Machinery Dealers' Association.

The programme for the fourth annual convention of the Southern Supply and Machinery Dealers' Association, to be held at the De Soto Hotel, Savannah, Ga., from April 25 to 28 inclusive, has been issued and it indicates that the session will be one of unusual interest. The four days of the convention will be crowded with events of importance to the trade. A noticeable feature of the convention will be the session of Thursday, when a number of papers on subjects of vital interest to the trade will be read and discussed. Joseph W. Wall of the Gardner Governor Company, Quincy, Ill., will read a paper on "What Has Been the Practical Result of the Establishment of Minimum Prices for Manufacturers?" and the members will be invited to discuss Mr. Wall's ideas, as will, be the case after the succeeding papers are read. Others will address the convention and the subjects they will speak on are:

"Is it to the Interests of the Dealers to Have Manufacturers Establish Minimum Prices?" William G. Simmons, Keith, Simmons & Co., Nashville, Tenn.; "Methods of Filing Catalogues in the Office," Bayless Lee, Lee Bros.. Memphis, Tenn.; "The Southern Supply Dealer—His Worst Enemy," Thomas Fritts, Tom Fritts' Hardware Company, Chattanooga, Tenn. "Our Salesmen—1, Which is the Best Method of Keeping Record as to the Results Accomplished? 2, What Daily Information Should They Submit to the House? 3, Best Method of Compensating Salesmen—Fixed Salary or Commission or Fixed Salary and Commission?" Forbes Liddell, Liddell Machinery & Supply Company, Montgomery, Ala.

The session of Tuesday afternoon will be one of importance, as at that time the manufacturers and their representatives attending the convention will gather in the gentlemen's parlor of the hotel for the purpose of forming a permanent organization to work in conjunction with the Southern Supply Dealers' Association. The organization will succeed the temporary association formed by several of the manufacturers who expect to be at the convention.

The convention will open on Tuesday with an address of welcome by Col. J. H. Estill, president of the Chamber of Commerce of Savannah, and Peter E. Blow of the Southern Brass & Iron Company, Knoxville, Tenn., will respond. William Wilmot of the Wilmot Machinery Company, New Orleans, La., will deliver an address of welcome to the manufacturers, and W. M. Mix of the Dodge Mfg. Company, Mishawaka, Ind., will respond, after which George V. Denny of the Georgia Supply Company will give the report of the Entertainment Committee. This committee has planned an automobile ride for the ladies attending the convention on Tuesday and a smoker for that evening, a steamboat excursion for Wednesday and an informal reception for Wednesday night, when John Temple Graves will talk on "The Reign of the Demagogue." There will be a trolley ride for the ladies on Thursday afternoon and a dance at the hotel that evening. On Friday afternoon and evening there will be a dinner and vaudeville performance at the Casino.

The Executive Committee for the convention will consist of George V. Denny; George A. Smith, Smith-Courtney Company, Richmond, Va.; Edward L. Stream, Gibbens & Stream, New Orleans, La., and John C. Doyle, Nashville Machine Company, Nashville, Tenn.

The heads of the various committees will be as follows: Manufacturers' Committee, John G. Christopher, Jacksonville, Fla.; Grievance Committee, Thomas G. Hyman, Hyman Supply Company, Newbern, N. C.; Transportation Committee, J. J. Disoway, Cotton States Belting & Supply Company, Atlanta, Ga.; Entertainment

Committee, George V. Denny. Special railroad and hotel rates have been arranged for the members of the association and their guests.

OBITUARY.

George H. Wallis, superintendent of the American Steel & Wire Company, San Francisco, Cal., died March 19 of heart failure, aged 65 years. He was a native of Canada, but served in the Union Army during the Civil War. He had been a resident of California for many years.

EBEN COREY of the iron and steel firm of E. Corey & Co., Portland, Maine, died March 25, aged 81 years.

ERNEST C. DALZELL, president of the Ideal Steel Company, Arlington, N. J., died March 21 of apoplexy, aged 50 years.

James M. Seymour, at one time a manufacturer of machinery in Newark, N. J., died April 1 of apoplexy. Mr. Seymour was for a period master mechanic on the Havana & Matanzas Railroad in Cuba. During the Civil War he devoted his time to gun making. In 1865, in partnership with Daniel Whitlock, he formed the firm of Seymour & Whitlock, Newark. He was Mayor of that city for three successive terms.

Record Breaking Sheet Shipments.—An unprecedented record for shipments of black and galvanized sheets was made in March at the Vandergrift Works of the American Sheet & Tin Plate Company, at Vandergrift, Pa., when 20,801 tons of black and galvanized sheets were shipped from this plant. The heaviest shipments in any previous month were 17,500 tons, so that March exceeded the best previous record by 3301 tons. The shipment of this tonnage is remarkable when it is considered that No. 24 gauge was the average of the entire March product. Joseph Murphy is superintendent of the shipping department at the Vandergrift Works and is entitled to great credit for the remarkable record he has made in shipping this very large tonnage. The total output of black and galvanized sheets and tin plate by the American Sheet & Tin Plate Company in March was much the heaviest in any one month since its organization, considerably exceeding 100,000 tons.

Enormous Sheet and Tin Plate Shipments.—During March the total shipments from all plants of American Sheet & Tin Plate Company were 54,924 gross tons of tin mill products and 54,392 gross tons of sheet mill products, the total shipments being 109,316 gross tons. This is an unprecedented record for shipments of sheets and tin plate in one month, and the American Sheet & Tin Plate Company expects to do equally as well or better in April.

At a meeting of the stockholders of the Passaic Steel Company, Paterson, N. J., the number of directors was reduced to 13, the following being elected: J. B. Cooke, A. C. Fairchild, B. Focht, C. Harris, G. A. Lee, J. R. Lee, N. McConnell, Dudley Phelps, F. F. Searing, T. B. Simpson, L. A. Waters, H. D. Zehnder and E. S. McNaul. The board elected A. C. Fairchild president, N. McConnell vice-president and general manager, and J. B. Cooke secretary and treasurer.

The Buffalo office of the Chapman Valve Mfg. Company has been discontinued, and hereafter orders from that section will be received by mail at the company's main office at Indian Orchard, Mass.

The committee of the United States Steel Corporation appointed to study the question of the establishment of furnaces, steel works and rolling mills in Canada has made its report. Action upon the same has not yet been taken.

The Morgantown tin plate plant was resold on April 4_q for the third time to John G. Frazier, who is said to represent the United States Steel Corporation.

New York.

New York, April 5, 1905.

Pig Iron.—In this immediate district there has been a moderate volume of business and prices continue steady. Some of the makers who had advanced their selling prices some of the makers who had advanced their seiling prices have, however, receded to meet competition in some cases. In others they have obtained a higher average. We continue to quote for Northern Iron, tidewater, \$18.25 to \$18.50 for No. 1 Foundry, \$17.50 to \$17.75 for No. 2 Foundry, \$17 to \$17.50 for No. 2 Plain and \$15.75 to \$16.50 for Gray Forge. Alabama and Tennessee Irons are quoted \$17.50 to \$17.75 for No. 1 Foundry and \$17.25 to \$17.50 for No. 2 Foundry. for No. 2 Foundry.

Steel Rails.—A number of Anthracite Coal roads have purchased additional quantities of Rails. We continue to quote \$28 for Standard Rails, at mill, for lots of over 500 tons.

Cast Iron Pipe.—A great change has come over this trade during the week. Business picked up remarkably, more tonnage having been entered since our last report than for the whole of the three previous weeks. Few large lots were purchased, the demand being of a general character. This condition of business is regarded as indicating the widespread demand which may be expected from this time forward. The foundries are confident that they will have sufficient business to keep well employed. Prices are stronger, and quotations are now \$27 to \$27.50 per net ton for 6 to 8 inch in carload lots, at tidewater.

Finished Iron and Steel.—The leading bridge interest reports its bookings during the month of March at 50,000 tons, made up almost entirely of small orders. The business thus secured is considerably larger than had been expected. The principal order placed with the same company in this district during the past week called for 4000 tons for the New York Central, consisting principally of bridge work for grade crossings. The railroad business is not active, but quite a little tonnage is expected to be placed in this line shortly. It is hoped that the air will be cleared this month in the building situation in this city. About 20,000 tons in all is now in sight, the Altman Building on Fifth avenue being the largest undertaking. In manufacturing buildings considerable business is in prospect, which is likely to be closed soon. The new buildings of the Halcomb Steel Company at Syracuse, N. Y., requiring a little under 1000 tons, went to a Pittsburgh company. Plates and Bars continue to show an improved demand with the mills in such condition that those desiring early delivery may have to pay premiums. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04¾c.; Fire Box, 1.94½c. to 2.50., according to specifications; Refined Bar Iron, 1.74½c. to 1.84½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—Quite a number of the larger rolling mills in the East are now so well supplied with stock that they are asking to have shipments deferred on further mateunder contract. Other mills, however, are making considerable purchases. Among the contracts placed the past week was one for 1000 tons of Cast Borings. A sale is also reported of 600 tons of Machinery Cast at full prices. It is stated that the Eastern Bar Iron manufacturers who held is stated that the Eastern Bar Iron manufacturers who held a meeting in this city last week, discussed the policy of discontinuing the purchase of inferior stock, such as Country Wrought, with the view of making a better quality of Refined Iron, in which case they would arrange prices of the finished product to correspond with the higher cost of their raw material. The demand for Steel Scrap from the Steel works continues very good. Quotations per gross ton, New York and vicinity, are approximately as follows: York

k and vicinity, are approximately as follows:	
Old Iron Rails\$22.00 to \$	22.50
Old Steel Rails, rerolling lengths 16.50 to	17.50
	17.00
	21.00
	18.50
	23.00
	20.50
	17.00
	20.50
	19.00
	18.50
	15.50
	12.00
	10.00
	13.50
	16.50
Stove Plate 13 50 to	14 50

Dilworth, Gilbert & Towne, Incorporated, have just embarked in business as mill agents and jobbers in Steel and Iron, with warehouse and office at 45 Cliff street, New York City. The officers are Chas. R. Dilworth, president; Thos. Towne, vice-president, and Joseph M. Gilbert, secretary and treasurer. The firm will represent several mills and also do a general jobbing and warehouse business in Steel and Iron. Chas. R. Dilworth, president of the company, is a large stockholder in Dilworth, Porter & Co., Limited, Pittsburgh, Pa., makers of Railroad Spikes, Tie Plates and Glendon Soft Steel Bars. The active charge of the business will be vested in the secretary and treasurer, Joseph M. Gilbert, who has been connected with the firm of Denman & Davis, jobbers in Steel and Iron, New York City, for the past five years.

Wm. F. Converse & Co. of 120 Liberty street, Pig Iron and Coke merchants, announce that they have been appointed by E. B. Leaf & Co. of Philadelphia the exclusive Eastern sales agents for the Hudson Foundry Iron.

Metal Market.

NEW YORK, April 5, 1905.

Pig Tin .- The market during the week was firm, but business was not active, buyers being still reluctant to buy any considerable quantities of the metal. Both spot and futures have advanced during the week. To-day's quotations for spot Tin are 30.20c. to 30.37½c.; April delivery, 30c. for spot Tin are 30.20c. to 30.37½c.; April delivery, 30c. to 30.25c.; May, 29.50c. to 30c.; June, 29.25c. to 29.75c. London spot has advanced considerably, to-day's quotations being £139 10s.; futures, £134 5s. It is pointed out that while spot Tin has advanced £3 and 5s. during the past two weeks, futures have declined 10s. in the same period. The arrivals so far this month are 230 tons, with 4542 tons afloat. The total statistics for Europe and the United States as compiled by C. Mayer, secretary of the New York Metal Exchange, show: Metal Exchange, show:

Total visible supply March 31, 1905	Tons. 14,592
Against visible supply February 28, 1905	14,911
Against visible supply March 31, 1904	15,662
Against visible supply December 31, 1904	14,768
Deliveries into consupmtion during March were	
amounting to 4000 tone The total for the three menths	

amounting to 4000 tons. The total for the three months of this year shows an increase of 1800 tons compared with the same period of last year.

The combined deliveries for London and Holland for March were 138 tons smaller than last year. For the three months the increase in deliveries amounts to 566 tons compared with the same period of last year.

Shipments from the Stantife of the same period of the stantife of the same period of the same peri

the increase in deliveries amounts to 566 tons compared with
the same period of last year.

Shipments from the Straits for March were 623 tons larger
than for the same month of last year. For the three months of
this year the increase in shipments amounts to 807 tons compared with the same period of last year.

Australia shipped 2 tons less in March compared with the
same month of last year. For the three months of this year
the shipments were 78 tons smaller compared with the same
period of last year.

The total visible supply on March 31, 1905, is 1070 tons below that of March 31, 1904.

Copper.-The market is quiet and entirely unchanged copper.—The market is quiet and entirely unchanged as to price. Domestic buyers are only taking small lots, and for such the closing quotations to-day are: Lake, 15.25c. to 15.37½c.; Electrolytic, 15.12½c. to 15.25c.; Casting Copper, 14.87½c. to 15c. The London market has had a slight decline. Spot quotations are £67 5s., and futures £67 12s. 6d., while Best Selected is also lower at £71 15s. The exports so far this month are 6402 tons, of which about 4100 tons go to China and Japan. The exports of domestic Copper from Atlantic ports during the month of March, as per custom house returns, were 20,168 tons. The total for three months this year shows a decrease of 10,089 tons compared with the same period last year.

Pig Lead .- The market is quiet, but steady, spot stock being quoted at 4.50c. to 4.60c. The American Smelting & Refining Company's quotation for shipment Lead remains The American Smelting unchanged, being 4.50c. in 50-ton lots. The London market slightly higher, the quotation being £12 11s. 3d. The S Louis market is nominal at 4.47½c. to 4.52½c.

Spelter.-The Spelter market is dull and easy, the New York quotation being 6c. asked, for spot; April and May, 5.87½c. asked. St. Louis remains unchanged at 5.75c. The London market has declined, to-day's quotation being £23 7s. 6d.

Quicksilver.—The market is practically unchanged, flasks of 75 lbs. being quoted at \$38. The London market is quoted at £7 12s. 6d.

Nickel.-The tone of the market is quiet. practically unchanged, large lots being quoted at 40c. to 45c., and smaller quantities at 50c. to 60c.

Tin Plate.—Prices remain firm. The American Sheet & Tin Plate Company continues to quote on a basis of \$3.74 a box for 14 x 20 100-lb. Coke Plates, f.o.b. New York, or \$3.55, f.o.b. Pittsburgh. Plates are now held in Swansea at 11 shillings 9 pence.

The Morgan continuous mill of the International Harvester Company, at South Chicago, Ill., consisting of a roughing train with 8-inch and 11-inch finishing stands, made a record breaking run in the month of March, when in 54 turns it produced 7540 gross tons of finished product. This output was made in the regular course of business and covered a wide variety of sizes from 7-16 to 2 inches in rounds and % to 1% inches in squares and other miscellaneous sections within the same range.

The American Maritime League.

An organization of persons favorable to securing legislation for the rehabilitation of the American merchant marine has been perfected, with headquarters at Washington. The organization is called the American Maritime League and ex-Senator John M. Thurston of Nebraska has been chosen president.

It is explained that when it became evident that the Fifty-eighth Congress would not act upon the recommendation of the Maritime Commission, a body composed of Senators and Representatives authorized to investigate the decadence of American shipping, a number of business men of New York conceived the idea that the only effective way to reach Congress was to arouse public sentiment. This they proposed to do through an organization that, embracing business men in every section of the country and of every shade of political opinion, would call upon Congress to do something toward restoring the merchant marine to the eminent position it held in the

Through correspondence leading business men in the principal cities of the East and West were induced to join in the movement, and the membership of the league now numbers several hundred. Among those composing the Advisory Board are ex-Secretary Elihu Root, Secretary Paul Morton, Attorney-General Moody, Secretary Taft, ex-Senator Warner Miller and ex-Secretary Benjamin F. Tracy of New York.

A magazine will be established in Washington whose columns will be open to a nonpartisan discussion by all members of the league, and prior to the assembling of Congress meetings will be held in various parts of the

Iron and Industrial Stocks.

New York, April 5, 1905.
The iron and steel stocks have been the feature of the past week on the New York Stock Exchange. Under the stimulus of good trade reports and intimations that current earnings are heavy, the United States Steel stocks advanced sharply to new high records on the present movement. The common advanced from 35¼ on Thursday of last week to 37½ on Tuesday of this week, while the preferred in the same time advanced from 951/8 to 987/8, and the new 5's from 94½ to 96½. The Southern iron group also made a notable showing as a result of the reports in circulation that the proposed merger was making satisfactory progress. Tennessee Coal advanced from 94½ on Thursday of last week to 106½ on Tuesday of this week, while Sloss-Sheffield common, which had sold at 92½ on Friday, reached 100 on Monday, and Republic preferred in the same time advanced from 80½ to 84%. Republic common also had a good advance, selling up from 21% to 24%. Other stocks which showed advances worthy of notice were Can preferred, which moved up from 65% to 67½, Car & Foundry preferred from 99½ to 103, American Steel Foundries preferred from 64% to 67½. to 671/2, Pressed Steel common from 401/4 to 43, Pressed Steel to 67½, Pressed Steel common from 40¼ to 43, Pressed Steel preferred from 93 to 96½, Railway Spring common from 35% to 37%, Railway Spring preferred from 93½ to 96½ and Virginia Iron & Coal from 48½ to 49%. Last transactions in active stocks up to 1.30 p.m. to-day were made at the following prices: Can common 11½, preferred 68; Car & Foundry common 40, preferred 102%; American Steel Foundries common 17½, preferred 66; Locomotive common 50, preferred 117; Colorado Fuel & Iron, 56; Pressed Steel common 42½, preferred 95%; Railway Spring common 3616. common 42¼, preferred 95¾; Railway Spring common 36½, preferred 96½; Republic Iron & Steel common 23¾, preferred 83; Sloss-Sheffield common 97½, preferred 125; Tennessee Coal & Iron, 104½; United States Steel Company common 36¾, preferred 98¾; new 5's, 96.

Dividends.-The La Belle Iron Works, Steubenville, o, has declared a dividend of 1½ per cent., payable May This is the first cash dividend declared since October 1, 1902, as it has been the policy of the directors not to declare

a dividend unless earnings fully justified it.

The American Smelting & Refining Company, New York, has fixed a permanent dividend date the first day of each quarter, January, April, July and October, for the preferred and the fifteenth day of each quarter as dividend dates for the common stock.

The Manufacturers Light & Heat Company of Pittsburgh has declared the regular quarterly dividend of 11/2 per cent., payable April 20.

The Rock Run Fuel Gas Company, Pittsburgh, Pa., has declared a quarterly dividend of 1% per cent. The Westinghouse Machine Company, East Pittsburgh, Pa., has declared quarterly dividend No. 38 of 21/2 per cent., payable April 10.

New York Pig Iron Warrant Market.

The demand for pig iron certificates on the New York rroduce Exchange has been rather light the past week. The sales, which amounted to 700 tons, were all for regular certificates, and included 200 tons April, \$16.45; 100 tons May, \$16.60 and 100 tons May, \$16.65; 200 tons June, \$16.65, and 100 tons July, \$16.60.

The following quotations were established on call Wednes-

day ao	-												—Res	rular.—	Four Bid.	adry.
													Bid.	Asked.	Bid.	Asked.
Cash .		 	۰		0								\$16.50	\$16.75		
April .					0			 0	0	0		0	16.50	16.75	\$16.70	\$17.00
June		 	0							0			16.50	16.90	16.70	17.00
July		 											16.50	17.00	16.65	17.00
October		 										٠			16.65	17.00
Februar	y		0	0	0	0	0 0		0	0	0				16.60	17.00

Large Machinery Contract.—The United Engineering & Foundry Company, Farmers' Bank Building, Pittsburgh, builder of rolls and rolling mill machinery of all kinds, has recently secured some large contracts. Among these is a 14-inch continuous skelp mill with 10 stands of rolls and pinions for the new tube mill of the National Tube Company, at Lorain, Ohio. This mill was designed by engineers of the National Tube Company and contains some new features. The same company has a contract from the Halcomb Steel Company, now building a large crucible steel works at Syracuse, N. Y., for an 18-inch sheet mill and for 14, 12 and 9 inch merchant mills for the rolling of high carbon crucible steel. It will furnish shears and entire roll lathe equipment for this plant. The company also has a contract from the Lackawanna Steel Company, Buffalo, N. Y., for two 50-inch roll lathes, motor driven, equipped with new variable speed change gear, this device having recently been designed by the United Engineering & Foundry Company. The same company will furnish the blooming mill tables and manipulator for this plant, designed by the Wellman-Seaver-Morgan Company of Cleveland.

The Solid Steel Tool & Forge Company Receivership.—Owing largely to dissatisfaction among the stockholders a receiver has been appointed for the Solid Steel Tool & Forge Company of Brackenridge, Pa., near Pittsburgh. The company manufactures drop forgings, track, mining and blacksmiths' tools. James D. Wilson has been appointed receiver, and has received authority from the courts to operate the plant until the stock of materials on hand is worked up and all contracts on the books are filled. It is said this company is perfectly solvent, the receivership being due entirely to some dissatisfaction among the stockholders, who claimed it was The receiver states that all claims operating at a loss. will be paid in full.

William H. Truesdale, president of the Delaware, Lackawanna & Western Railroad Company, and Thomas B. Kent, president of the Holmes, Booth & Haydens Company, have been elected directors of the E. W. Bliss Company, Brooklyn, N. Y., to fill vacancies caused by the deaths of Joseph C. Willetts and Frank W. Moss.

Instead of tightening a belt by cutting out a piece certain up to date shops now apply a belt which is originally a foot or 15 inches too short and insert in the gap a short section of the same width. In the toolroom are kept a variety of lengths of each width of belt used in the shop, and when a belt becomes slack a shorter fill-in piece is substituted, this being repeated as often as may be necessary. The removed sections may be used in other belts.

Lucius A. Cole, president of the National Lead Company. New York, stated this week that negotiations for the merger of the United Lead Company with the National Lead Company are still pending and he has hopes that the merger will be effected. It is believed in trade circles that the negotiations have reached a point whereby formal statement will shortly be made that the merger has been completed.

HARDWARE.

YEAR has passed since the catalogue house question was made a dominant one in the trade. Our readers will recall the impression, we might almost say the sensation, produced by the presentation in The Iron Age, April 7, 1904, of the facts relating to this form of competition and the duty of the trade in the circumstances. In connection with an able and outspoken letter from a prominent jobbing house attention was called editorially to the situation as demanding the united interest and co-operation of all classes in the trade. The subject had indeed been discussed before by the merchants in a desultory and timid fashion generally as a thing to be spoken of in whispers under the apprehension that publicity would only increase the mischief. For the past year, however, the problem of catalogue house competition has been under consideration conspicuously and without disguise. It has indeed commanded the formal attention of associations and the thought of merchants in all parts of the country, uniting organizations and individuals in a common effort which is without parallel in the history of the trade.

The work of the Catalogue House Committee, which was constituted to represent the distributers of Hardware, has met with general approval, in view of the wisdom and conservatism which have characterized its investigations and recommendations. This was indeed to have been expected from the character and standing of its members as business men, whether in the wholesale or retail field. When the subject was first taken up there was on the part of manufacturers especially (a department of the trade which for some reason was not represented on the committee) more or less apprehension that extreme measures might be resorted to and a general disturbance of the existing methods of distribution thus precipitated. Fortunately these fears have not been realized. It is gratifying, too, to note that the spirit of conservatism on the part of the committee prevails also among the merchants, who are apparently less disposed than a year ago to resort to violent measures in combating what is recognized as a serious menace to the regular distribution of goods. This is an encouraging sign of the trend of things.

While the personnel of the committee and the ability and balance of its members would seem to be an adequate assurance that unreasonable and radical measures would be discountenanced, there is no doubt a further conserving force from the fact that the committee is representative of two great associations, which will be held responsible for any course pursued by it. It is not to be supposed that so great and influential a body as the National Hardware Association, made up of so many of the leading jobbers of the country, or the National Retail Hardware Association, which has in its membership such a multitude of progressive merchants, would look with approval upon radical measures the resort to which would be to develop ill feeling, disturb existing relations and in many ways tend to the increase rather than the diminution of the evils under which the trade are suffering. The jobbers certainly would look with disfavor upon any measures which would accentuate the tendency on the part of manufacturers to aid the retail trade by selling them at prices which would enable them to compete with the catalogue houses much better than they can at present. The conservatism and good sense of the great associations so uniting their efforts for the betterment of trade conditions, together with the wisdom and judgment of the committee in charge of the movement, may be relied upon, we trust, to secure the continuance of a broad policy so far as the official treatment of the problem is concerned. The year's discussion of the subject, if it has not resulted in all that might have been desired, has accomplished something and certainly furnishes ground for congratulation in that obvious dangers have been avoided and a safe and reasonable course pursued.

Condition of Trade.

Business throughout the country is responding to the influences of the season and a quickening demand is reported generally from Hardware centers, manufacturing and distributing. With the manufacturers of many kinds of goods in the line of Shelf Hardware, Tools, &c., there is more or less complaint that the volume of business is not up to their expectation, but there are indications of improvement and an almost universal expectation that a prosperous business will be enjoyed during the next few months. Articles in the line of Heavy Hardware are very firm in price, and Shelf goods as a rule are held without change, with, however, occasional advances which tend to emphasize the general strength of the market. Some of the advances are accomplished through the action of combinations or other more or less artificial arrangements between the manufacturers and are not always the result of increased cost in production or of a large volume of business. Changes in list prices have of late given the trade more or less trouble and introduce something of uncertainty in current prices, for the time being at least, These are, however, among the conditions under which business must be conducted in a complicated field like Hardware. The financial situation continues to give little cause for complaint or solicitude, as money is generally abundant and payments, except by those who are constitutionally slow, are promptly made.

Chicago.

Although most of the large lobbers and the large retailers of Hardware in Chicago have not yet been able to arrive at the actual figures for the March business, the feeling is very general that March has been an excellent month in most lines, breaking records in some, and April promises to do still better. It is of course natural that on a rising market merchants should buy in rather larger quantities than their actual trade demands, and this feature of anticipating future wants has played a prominent part in the business of the Hardware trade for the last three months at least. Fortunately, Hardware conditions are highly favorable, with the result that the active buying of the consumers in the great Western country is above the usual standard and promises to remain so unless some untoward weather or crop condition brings about a natural check. Eave Trough and Conductor Pipe have been advanced about 10 per cent. Registers, both floor and side wall, which have been sold at 75 and 10 per cent. discount to the trade, are now held firmly at 75 per cent., jobbers being notified that any sales at a lower price than 75 per cent. will result in the loss of rebates to them. Steel goods such as Forks, Rakes and Shovels are moving much more actively than was expected at this time of year, and Garden Tools and small Implements are in the same category. Garden Hose and Fixtures are also in keen demand. Jobbers are put to their utmost efforts to supply the demand for Poultry Netting and Screen Cloth. are quiet, but Barb Wire is quite active. Woven Wire Fencing is in excellent demand. An encouraging feature of the present situation is the comparative ease of collections, and the credit departments of the large jobbing houses are having a comparatively small number of customers unable to meet current demands. This of course means that the retail merchant is finding his collection problem less complex than usual. Locally Hardware trade is none too active, unless it might be in the Builders' Hardware line, which is very good. The settlement of the controversy between carpenters and contractors in Chicago and Cook County, which, barring unforeseen complications, will be permanent throughout the year, has resulted in the placing of a good volume of business which had been held up pending this settlement. The city School Board is in the market for large quantities of Hardware for new school buildings, and the larger retailers are bidders on these contracts along with some jobbers who are none too careful of the prerogative of their retail customers. An unusually large number of residences and flats is being built in the city and suburbs of Chicago, and the demand for Roofing and Builders' Hardware materials for such structures is correspondingly active. In the line of Machinists' Tools and Supplies, such as are ordinarily carried by Hardware merchants, city demand is rather slow, but such firms as reach out into the country for business through the medium of the mails or traveling salesmen are highly gratified by the volume of trade which comes in from the whole West from Louisiana to Minnesota and from Texas to Montana. One of the two leading mail order houses in Chicago has just completed a very large addition to its Stove foundry, claiming that it is now turning out 600 Stoves a day in addition to the new line of Safes just taken on in the same plant. While it is natural for retail Hardware merchants to assume that the present growth of their business is due to a victory over the mail order houses, yet these same mail order houses are claiming even greater increase in their own business. They enjoy at the present time a great advantage in the fact that the goods they are selling this season at the higher prices justified by increased cost of raw materials were bought for the most part last summer and fall, when prices were lower, premitting them to quote what are apparently cut prices and yet making large margins of profit over cost. Stove and Furnace interests profess to be greatly encouraged at the early inquiry for fall business, stimulated doubtless by the feeling generally prevalent in the market that the cost of materials entering into Stoves and Ranges will continue to advance, and that prices will be higher before they are lower. It is human nature to buy liberally on an advancing market, even though prices appear to be higher than is consistent with intrinsic value, and this tendency is in evidence in every branch of the market, buyers everywhere anticipating wants liberally, whereas on a falling market they would be buying only a small fraction of present commitments. Whether the materials bought on the present basis will be marketed at a profit will depend largely upon the condition of the crops and the general trend of the iron and steel markets. At the present time all prospects are favorable for a continuation of the present prosperity.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The month of April has started off splendidly and bids fair to be as good a month as March was, which is saying a great deal, as March was one of the best months this company has ever had. The movement of all spring and summer goods is exceptionally heavy, and stocks are becoming somewhat depleted. There is already a scarcity of Refrigerators, Freezers, Lawn Mowers, Wire Cloth and other goods of this character. The number of out of town merchants from all over the South who have visited this city during the past 30 days has broken all records, and has kept everybody in the wholesale houses busy waiting on the trade, who have bought heavily.

The city of Nashville seems to be enjoying an unusual degree of prosperity at this time. Real estate all over the city and suburbs has advanced 20 to 75 per cent. during the past eight months. The amount of building and construction work going on in the city is really wonderful, and carpenters and mechanics are in great demand. The bank clearings each week show a large increase over the corresponding weeks of last year.

Quite a number of manufacturing plants have been started here recently, and three new banks and trust companies have opened their doors during the past year, and all of them have been very successful. Nashville, from its geographical situation, is admirably located to be the distributing center for a large section of the Southern and Southwestern territory, and is surely destined to be one of the greatest cities in the South. We are glad to report that collections continue to be very satisfactory.

Louisville.

Belknap Hardware & Meg. Company.—The beautiful spring weather which has prevailed during the month of March has done much to stimulate business in this part of the country. Orders have been free, and what is quite as encouraging collections have recovered tone, so we are quite willing to believe the stories of abundant money in the country banks. Rates of interest are moderate, and those who have projected plans for development of properties, both in cities and in mining and agricultural districts, are encouraged to proceed by reason of comparative ease in the money market.

Credits are not being curtailed, and taken as a whole the future is one of promise. There has never been so much building in our own city as is at present under way. Several new banks have been started, and office buildings to accommodate these will change the aspects of some of our most populous corners. In May will be opened the large new hotel, which came in response to a growing demand from the traveling public. Meetings of various organizations have been held here this spring, and many are yet to be held. The Association of Stationary Engineers and the Travelers' Protective Association and others might be mentioned.

The visit of the President scheduled for April 4 is quite an event, as it reminds his older personal friends here of the time when he was at work as student and author digging out rich material here for his "Winning of the West." The election last fall fully justified the choice of this title and made it a singularly happy one.

St. Louis.

Norvell-Shapleigh Hardware Company.—Business is very good. The activity of March was a pleasant change from the dullness of February, and will make it a considerably better month than the same month last year. We will be very much disappointed if we do not enjoy larger sales in the spring and summer months of this year than last.

The World's Fair drained this territory of millions of dollars. Salesmen found many merchants away from home. The Fair opened May 1 and a decided halt and reaction in general business were apparent all over the country the latter part of May, in June and July. Even in a country as rich as ours millions of dollars cannot be diverted from the usual channels of trade without the effect being felt. Last summer there were tremendous increases in all lines in the retail business in St. Louis. There is no doubt the small towns in our territory suffered in corresponding degree.

It is interesting to note that contrary to the experiences of the cities of Philadelphia and Chicago no reaction in St. Louis has followed the World's Fair. Real estate transactions have been in greater volume the past 90 days than ever before. The number of building permits issued in the last 60 days breaks all previous records in the city's history. It is evident the World's Fair has led to a general stimulation and an increase of activity in all the various departments of our city life,

Cleveland.

THE W. BINGHAM COMPANY.—Fine weather is always a good tonic for trade, and at the present time we are enjoying fine spring weather to a marked degree. We are sending forward from this market large quantities of spring goods on orders that were entered early, and large, well assorted orders are coming to us through salesmen and by mail.

Nails and Wire are in fair demand. We are having an unusually good demand for Galvanized and Black Sheets, Eaves Trough and Conductor Pipe, also Wrought Merchant Pipe and Cast and Malleable Fittings. If the present warm, sunny weather continues, Lawn Hose will be in demand much earlier this season than it was last, and our advice to those who have not yet bought is to place their orders at once, for our jobbers are well supplied now with these goods at very favorable prices, although there was a decided advance made last year in all kinds of Rubber goods.

Builders' Hardware is in good demand. Also there is an unusually good demand for Carpenters' Tools of all kinds, Hand Saws, Planes, Auger Bits, Chisels, Hatchets, Hammers and other goods in this line. The low prices at which these goods have been offered were an incentive for the dealer to stock up liberally. The recent large orders placed by the railroads and manufacturing plants are helping to stimulate trade very much in all lines.

On the whole the general trade in Hardware is very satisfactory, and we will be obliged to work overtime to serve our many customers well and promptly.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.-March goes out in a blaze of glory as regards sales compared with March of last year. Clearings last week showed 49 6-10 per cent. increase, following increase of 35 and 60 per cent. in the two preceding weeks, indicating that general business is of good volume. For the month of February Portland led every port in the United States in wheat exports.

The Weyerhauser Syndicate has just completed purchase of 1500 feet of water front on which to erect the largest saw mill in the world. These people own millions of acres of Oregon fir. Their first and largest purchase was from the Northern Pacific Railroad.

Marshall-Wells Hardware Company since our last report has bought a block 200 x 200 feet, on which to erect a three-story warehouse where it will have railroad facilities. This with its six-story building erected by it last year will give ample room to handle its large business.

Indications now are that the three northwest Pacific States, Oregon, Washington and Idaho, will turn off next fall the largest crops in their history. February and for the first three weeks of March we had regular May and June weather that enabled the farmers to complete their work weeks ahead of the usual time, so that the crops have a fine start and should no misfortune overtake them they will be record breakers.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.-This market and other jobbing centers located on the Missouri River are enjoying a run of exceptionally fine business just now. Owing to the long and severely cold weather in January and February no preparations were made by consumers for their spring requirements, so that when the winter weather did show a break early in March trade suddenly developed into lively activity, and the month of March closes with a volume of business surpassing any previous record.

The present situation is very gratifying in a business way, and the outlook is equally pleasing. Orders from the country cover well assorted lines of goods, showing that stocks in the hands of retailers are not equal to the demand. At the same time dealers are alive to the situation and appear to have every confidence in the

NOTES ON PRICES.

Wire Nails.-New business with the mills is light, but specifications on contracts are coming in freely. Shipments of this character are supplying the requirements of jobbers, who are distributing Nails in large quantities in territory where weather conditions have been favorable for the commencement of building operations. No advance in prices has been announced, but the market is firm in tone at the following prices, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Carloads to jobbers.....\$1,80

Carloads to retailers.....

New York .- A gradual improvement is shown in demand, but the size and frequency of orders in the local market are affected by weather conditions. Owing to the severity of the winter, frost is just leaving the ground, so that excavating for buildings can be done, and the larger demand for Nails will come later. From territory tributary to this point orders are being received more freely for forward delivery. The market is firm and New York quotations are as follows: Single carloads, \$1.99; small lots from store, \$2.05.

Chicago, by Telegraph.—Consumption of Wire Nails is known to be very large, but there are so many jobbers, brokers and speculators who have Nails bought at lower prices than rule to-day that until these low priced contracts are executed mills will not receive much business. Jobbers and retailers both report heavy sales and shipments. Prices are unchanged at \$1.95, base, in car lots to jobbers; \$2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—The favorable weather of the past two weeks is bringing a better demand for Wire Nails, which are in better request than for some time. Output of Wire Nails in March by American Steel and Wire Company and Pittsburg Steel Company was extraordinarily heavy. Specifications on contracts are coming in better than for some time. The trade still anticipates an advance in prices of Wire Nails, but no announcement of this has been made by the leading interest. Prices are firm and we quote: Wire Nails in carloads to jobbers, \$1.80; carload lots to retailers, \$1.85, and in less than carload lots at \$1.90, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days.

Cut Nails .- At the meeting of the Cut Nail Association held last week March prices were reaffirmed for the month of April, with the understanding that an advance in Wire Nails would be followed by a corresponding advance in the price of Cut Nails without formal announcement. In the Pittsburgh and Chicago districts prices are being shaded quite generally at least 5 cents per keg on fair sized orders. Official quotations are as follows: Carload lots, \$1.80; less than carload lots to jobbers, \$1.85, and to retailers, \$1.95, f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails.

New York .- The demand continues moderate, conditions affecting the purchase of Wire Nails having the same bearing on Cut Nails in the local market. Prices are unchanged and New York quotations are as follows: Carloads on dock, \$1.94; less than carloads on dock, \$1.99; small lots from store, \$2 to \$2.05.

Chicago, by Telegraph.—The ruling price on Steel Nails is \$1.90, base, Chicago, or 5 cents below the Wire schedule. Iron Cut Nails made from Muck Bar Iron are held at about 10 cents premium over the official price for Steel Nails, making the ruling figure, Chicago, \$2.06. This price, however, is only obtained by mills which have the reputation of furnishing pure Iron Nails.

Pittsburgh.—Demand continues somewhat slow, but is reported a little better, due to the recent favorable weather. The light business in Cut Nails that has prevailed for some time has led to some shading in prices, about 5 cents a keg, or perhaps more, in official prices. While we do not change quotations, it should be noted that on current orders of fair size our prices are being shaded. We quote: Carload lots, \$1.75 to \$1.80; less than carload lots to jobbers, \$1.85, and to retailers, \$1.95, f.o.b. Pittsburgh. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents per keg advance over Steel Cut Nails. The above price of \$1.75 on Steel Cut Nails is the minimum of the market and is obtainable only by the large trade and for desirable orders.

Barb Wire .- Some improvement in the way of new business is noted by the mills, but jobbers are largely supplying their requirements by sending specifications on contract orders placed some time ago. Orders from retailers in the Western section of the country are of good volume and for immediate shipment. The market is firm in tone. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent, discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	\$1.95	\$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots		2.40

Chicago, by Telegraph.—Jobbers are taxed to their utmost to supply current demand for Barb Wire, both for shipment from store and for specification on their mill contracts. Contracting was done so heavily during the winter at lower prices than are now ruling that new mill business at present figures is comparatively light. Prices are unchanged, as follows: Car lots to jobbers, Painted Wire, \$2.10; Galvanized, \$2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, \$2.25; Galvanized, \$2.55; Staples, Bright, \$2.05; Galvanized, \$2.35.

Pittsburgh.—The favorable weather in March quickened demand to some extent and the mills are entering more orders than for some time. The tone of the market is firm, but prices are unchanged. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Painte	d. Galv.
Jobbers, carload lots\$1.95	\$2.25
Retailers, carload lots 2.00	2.30
Retailers, less than carload lots 2.10	2.40

Smooth Fence Wire.—Demand is improving and heavy drafts are made upon the capacity of the mills to keep up with shipments on contract orders. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

					-														
Jobbers,	carloads.		0			 				 			 	 	 	. 5	11.	6	j
Retailers	, carloads					 				 			 				1.	70)

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9	10	11	12&12	4 13	14	15	16
Annealed Base	\$0.05	.10	.15	.25	.35	.45	.55
Galvanized \$0.30	25	40	45	55	65	1.05	1.15

Chicago, by Telegraph.—Makers of Woven Wire Fencing are finding their trade so large this spring and so much earlier than usual that their specifications on mill contracts for Smooth Wire are exceptionally large and are taxing the capacity of mills to supply. New business on Smooth Wire, like other Wire products, is comparatively light. Prices are firm and unchanged, as follows: \$1.80, base, for Annealed Wire, in car lots to jobbers; \$1.85 in car lots to retailers, with 5 cents advance for less than car lots, and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—Demand is becoming more active, and a heavy business is anticipated by the mills during this month. Some large records for output were made during March by the leading Wire interests. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers,	carloads	\$1.65
Dotailore	oorloade	1.70

Conductor Pipe and Eave Trough, Galvanized.—Advances were made on Galvanized Conductor Pipe and Eave Trough by the manufacturers under date of March 23, the new discounts being as follows, less than carloads to dealers: Nested, Eastern territory, 70 and 15 per cent. discount; Central, 70 and 7½ per cent.; Southern, 65 and 10 per cent., and Southwestern, 60 and 15 per cent.; not nested, Eastern, 70 and 10 per cent.; Central, 70 and 2½ per cent.; Southern, 65 per cent., and Southwestern, 60 and 5 per cent. It will be observed the A. & B. Eastern classifications have been discontinued, the quotation now being simply for Eastern territory.

Eave Trough, galvanized, less than carloads to dealers, is now quoted: Eastern territory, 80 per cent. discount; Central, 75 and 10 and 5 per cent.; Southern, 75 and 5 per cent, and Southwestern, 70 and 5 per cent. discount. The freight allowance on both Conductor Pipe and Eave Trough is now on 500 lineal feet, instead of as formerly 250 lineal feet.

The extras on these goods have been advanced as follows, viz.: No. 27 gauge per lineal foot, 4 cents (formerly 2 cents); No. 26 gauge, 6 cents (formerly 4 cents), and No. 24 gauge, 12 cents per lineal foot.

Elbows and Shoes.—Under date of April 1 new list prices were announced by the manufacturers of Elbows and Shoes, previous lists and discounts being withdrawn. The new lists are as follows, subject to a discount on Tin, Galvanized Steel and Galvanized C. C. Iron Elbows and Shoes of 60 and 10 per cent., and of 37½ per cent. on the Copper:

Elbows, Round, Corrugated and Plain Round.

				-		Cop		
				-	-14-ou	nce.	16-01	ance.
	Galvan	ized	Galva	nized '		Shoes		Shoes
	steel o		C. C.	iron.	Elbows.	and	Elbows.	and
Size.	medes of		0. 0.		Nos. 0,	No. 4	Nos.	No. 4
In.	Elbows.	Shoes.	Elbows.	Shoes	. 1, 2, 3.	Elbows	1, 2, 3.	Elbows.
2	. \$0.25	.30	.50	.60	.75	.90	.80	.96
216	30	.36	.60	.72	.95	1.15	1.00	1.20
3	30	.36	.60	.72	.95	1.15	1.00	1.20
316	40	.48	.80	.96	1.25	1.50	1.30	1.56
4	40	.48	.80	.96	1.25	1.50	1.30	1.56
5	60	.72	1.20	1.44	1.70	2.05	1.80	2.16
6	70	.84	1.40	1.68	2.40	2.90	2.50	3.00

Souare Corrugated Elbows and Shoes,

	Galva	nized	Galva					
Size.		or tin.	C. C.		-14-ou			
In.	Elbows.	Shoes.	Elbows.	Shoes.	Elbows.	Shoes.	Elbows.	Shoes.
2	\$0.40	.48	.80	.96	1.15	1.35	1.20	1.45
3		.54	.90	1.08	1.45	1.70	1.50	1.80
4		.72	1.20	1.44	1.90	2.25	1.95	2.35
5		1.08	1.80	2.16	2.60	3.10	2.70	3.25

Paris Green.—Buyers are not giving much attention to the purchase of Green, evidently preferring to wait until nearer the time of actual demand. The schedule of prices made early in the season is adhered to, as given below. Quotations are as follows:

	Per lb.
Arsenic kegs	12 c.
Kegs, 100 to 175 pounds	12½c.
Kits, 14, 28 and 56 pounds	
Boxes, 2 and 5 pounds	13½c.
Boxes, 1 pound	14 c.
Boxes, ½ pound	15 с.
Boyes 1/2 pound	16 c.

These prices are subject to the following differentials:

	Extra.
5000 to 10,000 pounds	½c.
1000 to 5000 pounds	1 c.
500 to 1000 pounds	
Less than 500 pounds	

Lester Saw Set.—The Puritan Mfg. Company, Norwich, Conn., manufacturer of the Lester Patent Saw Set, announces that this article will be sold to the retail trade until May 1 at \$6.50 per dozen. This is a special introductory price, and after May 1 the price will be \$7.50 per dozen.

Rope.—Demand continues fairly active for the season, with promises of larger requirements after navigation opens. Prices are generally firm, although a lower than the regular quotation is reported on Sisal Rope by a concern which is not a large factor in the product. It is understood that the price is probably being used to induce business in other lines. Quotations are as follows: Pure Manila, 11% to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8% cents per pound.

Oils .- Linseed Oil .- Oil is remarkably quiet, the absence of large buyers in the market being very prominent. These perhaps have their requirements covered to the first of June, but lack of demand plays a large part in the condition of trade. Crushers could not sell Oil and make money at the present price of seed if they were obliged to buy seed to make it of. Some are consequently closing down their mills and holding for a possible advance. Cake is being offered for May delivery at a lower figure than for immediate shipment. Should the price of cake continue low, next month Oil might be advanced to even up the crushers' profits. The opinion prevails that demand will improve later in the season. According to reports, the amount of seed and Oil in the country is equal to, if not in excess of, the probable demand up to the time the Southwestern seed crop matures. Demand for small lots is fair. The market is firm at former prices. York quotations are as follows: City Raw, 47 to 48 cents per gallon, according to quantity; State and Western Raw, 45 cents, in any quantity.

Tacks, Nails, Brads, &c.—The manufacturers of Tacks, Nails, Brads, &c., have adopted a revised Hardware price-list of these goods, as here reproduced, taking effect April 1. In some of the schedules there are changes throughout, others remaining as formerly. Among the lines not changed are Copper Tacks, full weight; Hungarian Nails, half weight, and the Copper and Brass Tacks, Copper and Brass Gimp and Leathered Carpet Tacks, in bulk and in pound papers. In the group of goods sold by length changes have been made only in Finishing, Trunk and Clout Nails and the Tinned Trunk and Clout Nails, the remaining lines, which are sold only in moderate quantities being as heretofore. Where there was previously an identical list for American Cut Tacks and Carpet Tacks there are now separate lists, the same procedure applying to the Tinned goods in Cut and Carpet Tacks.

Another important feature of the list is the reversal of the mode of differentiating prices. For instance, where in the past extras were charged for the smaller packages the list is now based on the higher prices for the small packages, and a system of rebates adopted as the packages increase in size on 1, 5, 10, 25 and 100 pound papers or boxes, as the case may be. The table of rebates appended to the list covers this matter in detail. The discounts applying to this new list are as follows:

Goods Panered, Full, Half and Quarter Weight,

	Discounts.
American Cut	.90, 371/2 and 10 %
American Cut, Tinned90.	37½, 10 and 10 %
Swedes Cut	.90, 371/2 and 10 %
Swedes Cut, Tinned90.	371/2, 10 and 10 %
Upholsterers', Gimp and Lace	90, 50 and 10 %
American Carpet	.90, 371/2 and 10 %
American Carpet, Tinned90.	37½, 10 and 10 %
Trunk and Clout	80, 10 and 5 %
Trunk and Clout, Tinned	.80, 10, 10 and 5 %

Pound or Half Pound Papers or Bulk.

Carpet
Carpet, Tinned
Upholsterers', Bill Posters', Gimp and Lace. 90, 50 and 10 %
American Cut
Swedes Cut90, 37½ and 10 %
Swedes Cut, Tinned
Trunk and Clout
Trunk and Clout, Tinned80, 10, 10 and 5 %

TACKS FULL HALF AND QUARTER WEIGHT

	TACK	S, F	ULL,	HAI	F	ND	QU.	ARTI	ER W	EIGI	HT.							
*Swedes Iron Tacks, cents per doz. paper *Tinned Swedes Iron Tacks, cents per d	8 245	265	290	310	330	350	400						1200		1500	20 1650		
Gimp and Lace Tacks, cents per doz. pape	rs		400	4.5	450	410	990	620	190	929	1100	1210	1410	1100	1920	2100	2010	2000
papers		112	$\frac{600}{112}$	$\frac{650}{130}$	$\frac{700}{140}$	750 160	\$00 180	$\begin{array}{c} 900 \\ 200 \end{array}$	$\frac{1100}{252}$	1370 336	$\begin{array}{c} 1650 \\ 420 \end{array}$	$1950 \\ 504$	$\frac{2250}{588}$	2550 672	2900 756	3250 840	3600 924	3900 1008
*Swedes Iron Tacks, cents per doz. pape *Tinned Swedes Iron Tacks, cents per doz.	es. 1/2 rs	3/4	$\begin{array}{c} 1 \\ 155 \end{array}$	$\frac{1\%}{165}$	2 175	21/4 185	3 210	4 235	6 310	385	10 460	12 535	610	16 685	18 760	20 835	910	24 985
papers	rs		$\begin{array}{c} 250 \\ 210 \end{array}$	$\frac{255}{225}$	$\frac{260}{235}$	$\frac{265}{250}$	$\frac{275}{285}$	325 325	$\frac{420}{385}$	$\frac{520}{475}$	620 560	720 645	835 745			$\frac{1210}{1080}$		
papers	3		310 140	$\frac{335}{145}$	360 150	385 155	410 160	$\begin{array}{c} 460 \\ 185 \end{array}$	$\frac{560}{235}$	695 295	835 360	$\frac{985}{425}$	1130 500			1630 710		
papers Carpet Tacks, cents per doz. papers Tinned Carpet Tacks, cents per doz. pape	· · · · · · · · · · · · · · · · · · ·							160	$\frac{325}{210}$ $\frac{300}{300}$	395 270 370	475 335 450	$\frac{560}{400}$ $\frac{535}{535}$	660 475 615	$\frac{900}{545}$	1020	1150	1280	1420
Hungarian Nails, American Iron, cents doz. papers			0 0 0				59	75	92	110	125	150	170	185	200	220	* * *	
QUARTER WEIGHT. Ounc American Cut Tacks, cents per doz. pape Tinned American Cut Tacks, cents per d	es. ½	%	1 70	$^{1\frac{1}{2}}_{75}$	2 80	21/3 85	3 95	4 110	6 135	8 160	10 190	$\frac{12}{220}$	$\frac{14}{250}$	16 280	18 320	20 360	$\frac{22}{400}$	24 440
papers								95	$175 \\ 120 \\ 160$	$\frac{210}{150}$ $\frac{200}{200}$	$245 \\ 180 \\ 235$	$\frac{280}{210}$ $\frac{270}{270}$	$\frac{330}{240}$ $\frac{320}{320}$	$\frac{480}{270}$ $\frac{360}{360}$	550	615	625	755
IN POUND	AND 5	-POI	IND	PAPI	ERS	AN	D 10	-POI	IND	wooi	DEN	BOXE	S.					
*Swedes Iron Tacks, cents per pound *Tinned Swedes Iron Tacks, cents per pound Gimp and Lace Tacks, cents per pound Tinned Gimp and Lace Tacks.	nd	382	332 597	$\frac{252}{412}$	$\frac{197}{307}$	$\frac{172}{252}$	$\frac{157}{212}$	$\frac{142}{197}$	132 177 157	8 122 162 147	10 117 157 142	112 112 152 137	14 112 152 137	16 112 152 137	18 112 152 137	20 112 152 137	22 112 152 137	24 112 152 137
pound	· · · · ·		682	492	372	312	272	232	212	207	202	197	197	197	197	197	197	197
	TAC	KS	IN B	ULK	AN	D IN	PC	UND	PAF	PERS.								
Copper and Brass Tacks, cents per pound. Copper and Brass Glmp, cents per pound. Leathered Carpet Tacks, cents per pound.		200	$\frac{150}{200}$	110 150	$\frac{90}{120}$	$\frac{80}{110}$	70	80	6 56 76 67	8 56 70 59	10 56 64 55	56 62 50	14 56 60	16	18	20	22	24

COODS SOLD BY LENGTH

		GOO	DS 3	SOLL) R	L	NGI	H.									
Inch.	2 21/8		31/2		41/2		51/2	3 4	7 8	1	11%	11/4	11/2	1%	2	21/4	21/2
Finishing, Trunk and Clout Nalls, in 1/2	8 8	8	0	8	0	0	0	-3	0								
pound papers, cents per pound		62	52	4.3	38	36		33	31	29	29	29	29	29	29		
Tinned Trunk and Clout Nails, in 1/2-pound		. 02	-			-							-		-		
papers, cents per pound		. 74	64	54	49	47		44	42	40	40	40	40	40	40		
Basket, Cigar Box and Chair Nails, in pound																	
or bulk, cents per pound		. 66	56	46	40	38	35	33	30	28	26			***	***		
Basket, Cigar Box and Chair Nails, Tinned.		04	W-9	01	20	40	40	40	4.9	0.0	0.5						
in pound or bulk, cents per pound		81	6.1	0.1	9.0	433	40	43	41	39	37	* * *	* * *	* * *			* * *
Copper and Brass Finishing and Cigar Box Nails, cents per pound		70		68		6.4	64	62	60	58	50	5.0					
Copper and Brass Trunk and Clout Nails,		10		00		O.E	0.4	Ua	90	0317	90	56					
in pound or bulk, cents per pound		60		56		56	56	56	56	56	56	56					
Common and Patent Brads, half weight,																	
cents per doz. papers 7	0	84		91		100		115	125	140	160	175	260	315	340	***	
Common and Patent Brads, in pound or	= 440	400		0.4		0.00											
bulk, cents per pound17	5 140	120		81	0 0 0	67		50	4"	37	35	34	31	28	25		
Brush Tacks and Nails, in pound or bulk, cents per pound				120	105	00	90	70	60	EO	4.55						
Brush Tacks, full weight, cents per doz.				100	100	5161	90	10	00	5341	40		E. V +	* * *			* * *
papers				390	400	410	415	420	430	440	470						
Looking Glass Tacks, in nound or bulk, cents																	
per pound	0	105		62		55		49	43	37							
LOOKING GIRSS TRCKS, IUII WEIGHT, CENTS DEF																	
doz. papers				120		125		150	170	230							
ricture Frame Points, in pound or buik,																	
cents per pound	. 03			45		311		34	31	28							

* All kinds except Gimp, Lace, Brush and Looking Glass.
LIST REBATES.—Tacks except Brass, Copper and Leathered Heads packed in 25-bound boxes, deduct 6 cents per pound from list.
Tacks except Brass, Copper and Leathered Head backed in 100-bound kegs, deduct 12 cents per pound from list.
Trunk, Clout and Finishing Nails packed in 1-bound papers or 25-bound boxes, deduct 2 cents per pound from list.
Trunk, Clout and Finishing Nails packed in 100-bound kegs, deduct 4 cents per pound from list.
American Cut and Carpet Tacks have same list in pound papers, 5-bound papers and 19-bound boxes as Swedes Iron Tacks

Set and Cap Screws.—At a meeting of the Milled Screw manufacturers held in New York on March 31 a new list was adopted which corrects the inequalities of the former Cap and Set Screw lists. On account of the very small quantity of Square Head Cap Screws consumed it was decided to abandon the old list on this line, and hereafter Square Head Cap Screws will be sold from the list and at the prices prevailing on Hexagon Head Cap Screws. The new lists are given below and are subject to the following discounts:

Set Screws. Dis	count.
Regular C. H. Cup and Oval Points	.80 %
Soft Screws, Cup and Oval Points80 at	nd 5 %
Headless C. H., Cup and Oval Points	.80 %
Steel Set Screws, 25 % net advance over Iron.	
Cap Screws.	
Square Heads, regular finish	.75 %
Square Heads, rough or black	id 5 %
Hexagon Heads, regular finish	.75 %
Hexagon Heads, rough or black75 ar	id 5 %
Steel Cap Screws, 25 % net advance over Iron,	-
The new lists are as follows:	

the following o	nscoun	its;			,	The	new lis	ts are a	s follow	s:	
				IRON	SET	SCREV	vs				
					Price pe		· N.				
Thds to	18	16	14	12	12	11	10	9	s	7	7
Diam. of								7-8	1	11-8	1 1-4
screw. 1-4 ½ 1.80	5-16 2.00	3-8 2.35	7-16	1-2	9-16	5-8	3-4	7-8		11-8	1 1-4
% 1.90	2.10	2.45	2.80	3.30							
% 2.00	2.20	2.50	2.90	3.40	5.00	5.00					
% 2.10	2.30	2.60	3.00	3.60	5.50	5.50	10.00				
$ \begin{array}{cccc} 1 & 2.15 \\ 1\frac{1}{4} & 2.30 \end{array} $	$\frac{2.35}{2.50}$	$\frac{2.65}{2.85}$	$\frac{3.10}{3.50}$	$\frac{3.80}{4.30}$	$\frac{5.75}{6.50}$	$\frac{5.75}{6.50}$	$10.00 \\ 11.00$	15.50		* * * * *	
11/2 2.50	2.70	3.10	4.00	4.80	7.25	7.25	12.00	16.20	22.00		
1% 2.75	3.00	3.50	4.50	5.40	8.00	8.00	12.80	17.70	24.00	41.70	*****
2 3.25	3.50	4.00	5.15	6.00	8.80	8.80	13.60	19.20	26.00	45.00	54.00
$2\frac{1}{4}$ 3.75 $2\frac{1}{2}$ 4.25	4.00	4.50	5.75	6.75	9.60	9.60	14.50	20.70	28.00	48.30	58.30
2½ 4.25 2¾ 4.75	$\frac{4.50}{5.00}$	$5.00 \\ 5.50$	$6.35 \\ 6.75$	$7.50 \\ 8.25$	$10.40 \\ 11.20$	$10.40 \\ 11.20$	$15.40 \\ 16.30$	$\frac{22.20}{23.70}$	$\frac{30.00}{32.00}$	$51.60 \\ 54.90$	$62.60 \\ 66.90$
3 5.25	5.50	6.00	7.20	9.00	12.00	12.00	17.30	25.20	34.00	58.20	71.20
31/4			7.60	9.75	12.75	12.75	18.40	26.70	36.00	61.50	75.50
31/2	****		8.00	10.50	13.50	13.50	19.50	28.20	38,00	64.80	79.80
3%	* * * *		8.50	11.25	14.30	14.30	20.75	$\frac{29.70}{31.20}$	40.00	68.10	84.10
41/4	* * * *		9.00	12.00	15.10	$15.10 \\ 15.90$	$\frac{22.00}{23.50}$	32.70	$\frac{42.00}{44.00}$	$71.40 \\ 74.70$	$88.40 \\ 92.70$
41/2						16.70	25.00	34.20	46.00	78.00	97.00
4¾							26.50	35.70	48.00		101.30
Add for 50			* * * * * *		****		****	37.20	50.00	84.60	105.60
each 1/4 in . 50	.60	.70	.80	.90	1.10	1.10	1.50	1.70	2.25	3.30	4.30
			HE	VAGON	HEAD	CAPS	CREWS	2			
			11132		Price pe		CICLITY	3.			
Thds to inch. 20	18	16	14	12	12	11	10	9	8	7	7
Diam. of	5-16	3-8									
34 3.00	3.25	3.75	7-16 4.50	1-2 5.70	9-16	5-8	3-4	7-8	1	11-8	1 1-4
% 3.15	3.40	3.90	4.70	5.80							
1 3.25	3.50	4.00	4.90	5.90	9.25	9.25					
11/4 3.50	3.75	4.25	5.30	6.50	9.50	9.50	12.50	:::::			
$1\frac{1}{2}$ 3.75 $1\frac{3}{4}$ 4.00	$\frac{4.00}{4.25}$	$\frac{4.50}{4.85}$	$\frac{5.70}{6.10}$	7.10	10.00	10.00	13.50	18.40	00 75	****	
2 4.25	4.85	5.20	6.50	$7.70 \\ 8.30$	$10.75 \\ 11.50$	$10.75 \\ 11.50$	$14.50 \\ 15.50$	$\frac{19.70}{21.00}$	$22.75 \\ 25.00$	34.00	38.50
21/4 4.70	5.35	5.55	7.15	8.90	12.60	12.60	16.50	22.40	27.25	36.75	42.00
$2\frac{1}{2}$ 5.25	5.80	6.00	7.50	9.50	13.60	13.60	17.50	23.70	29.50	39.50	45.50
2% 5.75 3 6.25	6.30	6.65	7.90	10.10	14.40	14.40	19.00	25.00	31.75	42.25	49.00
$\frac{3}{3\frac{1}{4}}$ 6.25	6.80	7.20	$8.40 \\ 9.15$	$10.70 \\ 11.50$	$15.20 \\ 16.00$	$15.20 \\ 16.00$	$20.60 \\ 22.10$	$\frac{26.40}{28.20}$	$34.00 \\ 36.25$	$45.00 \\ 47.75$	$52.50 \\ 56.00$
31/2			9.75	12.30	17.30	17.30	23.70	30.00	38.50	50.50	59.50
3¾			10.50	13.10	18.60	18.60	25.30	31.80	40.75	53.25	63.00
4			11.10	13.90	19.90	19.90	26.90	33.60	43.00	56.00	66.50
41/4						21.20	28.50	35.40	45.25	58.75	70.00
43/4						22.50	$30.10 \\ 31.70$	$37.20 \\ 39.00$	$47.50 \\ 49.75$	$61.50 \\ 64.25$	$73.50 \\ 77.00$
5								40.80	52.00	67.00	80.50
Add for each 1/4 in . 40	.50	.60	.70	.80	1.30	1.30	1.60	1.80	2.25	2.75	3.50
Caca 7g in			~~				~~				
			SQ				CREWS	5.			
Thds to	18	16	14	12	Price pe	27 100. 11	10	0		-	-
Diam. of							10	9	8	7	7
% 3.00	5-16 3.25	3-8 3.75	7-16 4.50	1-2 5.70	9-16	5-8	3-4	7-8	1	11-8	1 1-4
% 3.15	3.40	3.90	4.70	5.80					****		
1 3.25	3.50	4.00	4.90	5.90	9.25	9.25					
11/4 3.50	3.75	4.25	5.30	6.50	9.50	9.50	12.50				
11/2 3.75	4.00	4.50	5.70	7.10	10.00	10.00	13.50	18.40			
1¾ 4.00 2 4.25	$\frac{4.25}{4.85}$	$\frac{4.85}{5.20}$	$6.10 \\ 6.50$	$7.70 \\ 8.30$	$10.75 \\ 11.50$	$10.75 \\ 11.50$	$14.50 \\ 15.50$	$\frac{19.70}{21.00}$	22.75	24 00	90 50
21/4 4.70	5.35	5.55	7.15	8.90	12.60	12.60	16.50	22.40	$\frac{25.00}{27.25}$	$34.00 \\ 36.75$	$\frac{38.50}{42.00}$
21/2 5.25	5.80	6.00	7.50	9.50	13.60	13.60	17.50	23.70	29.50	39.50	45.50
2% 5.75	6.30	6.65	7.90	10.10	14.40	14.40	19.00	25.00	31.75	42.25	49.00
3 6.25	6.80	7.20	8.40	10.75	15.20	15.20	20.60	26.40	34.00	45.00	52.50
31/2	* * * * *		9.15 9.75	$\frac{11.50}{12.30}$	$16.00 \\ 17.30$	$16.00 \\ 17.30$	$\frac{22.10}{23.70}$	28.20	36.25	47.75	56.00
3¾			10.50	13.10	18.60	18.60	25.70 25.30	$30.00 \\ 31.80$	$38.50 \\ 40.75$	$50.50 \\ 53.25$	$59.50 \\ 63.00$
4			11.10	13.90	19.90	19.90	26.90	33.60	43.00	56.00	66.50
41/4	****					21.20	28.50	35.40	45.25	58.75	70.00
43/4	* * * *			* * * * *		22.50	30.10	37.20	47.50	61.50	73.50
5	* * * * *		*****	*****			31.70	$\frac{39.00}{40.80}$	49.75	64.25	77.00
Add for 40	.50	.60	.70	.80	1.30	1.30	1.60	1.80	52.00 2.25	67.00 2.75	80.50
each ¼ in · 10		-		.00	1.00	2.00	1.00	1.00	4.20	2.10	3.00

Trade Winning Methods.

This department will contain a description of approved methods of bringing customers to the store by means of newspaper advertising, circulars and such special expedients and methods as are found useful by enterprising and progressive Hardwaremen.

A cordial invitation is extended to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

STIMULATING EARLY BUYING.

Several weeks since in connection with a "Clean Sweep Sale," beginning March 1 and continuing until March 23, E. M. Austin, Litchfield, Ill., issued a large circular, a portion of which, including the heading, is reproduced herewith. The circular was about 18 x 24 inches, and called especial attention to furniture, carpets, Sewing Machines and articles in the household line, such as rockers, couches, pillows, cupboards, &c., on which attractive prices were given. Under the title, "Austin Makes It Easy to Lie," prices were mentioned on iron beds, springs, mattresses, comforts, cots, &c. "In Main Store-Every Aisle Glistens With Bargains," was the label with which a large variety of house furnishing Hardware was brought to the public eye. Other goods covered by the circular were Dairy Supplies, Paints, Buggies, &c. Prominent announcement was made of the fact that Mr. Austin "'stands behind' every word of the above." At the bottom of the circular was a list of nearly 100 parties whose homes have recently been furnished by this firm, together with the intimation, We Refer to Every One.'

Mr. Austin, who does considerable business on the installment or monthly payment plan, and finds it pays, issues circulars of this sort every little while. They are printed in lots of about 3000, and have been found very effective in securing the attention and business of the public.

We are just in receipt of his circular for April, in

ment. It cannot be bought, however; it must be created. The purpose of our annual spring opening and sales days has been to acquire this public approval. Augment of business has been our reward from a generous public.

The circular is accompanied by a yellow slip or card which entitles the adult holder to a buggy whip free when presented at the store during the continuance of the sale. The card reads as follows:

RETURN THIS CARD

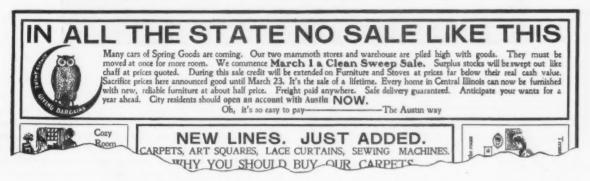
DURING OUR

SPRING OPENING AND SALES DAYS APRIL 6TH, 7TH AND 8TH

and get a buggy whip free of charge. The whips will be 6 feet long, painted black and better than any we have ever given. No whips will be given to children and only one whip will be given to each person. No person can get a whip without presenting this card on any of the three days, April 6-7-8. Everybody can have a catalogue with one of these cards inclosed by sending for one before the opening. Do not send for your whip with some other person. It will not be given that way. Do not return the catalogue.

WOOSTER HARDWARE CO.

In connection with the sale the firm has prepared a well printed 72-page catalogue about 6 x 7 inches in dimensions, of which 8000 copies have been distributed



Heading (Reduced) of Poster Circular, 18 # 24 Inches in Size.

which special bargains are announced in his 15 departments, including Hardware, Vehicles, Paints, Harness, Seeds, Stoves, Tinware, Glassware, Crockery, Bicycles, Sewing Machines, &c. The circular is about the same dimensions as the one above referred to, and gives a multitude of prices on a wide variety of goods.

SPRING OPENING.

WOOSTER HARDWARE COMPANY, Wooster, Ohio, anounces its eighth annual "Spring Opening and Sales Days," April 6, 7 and 8, in a four-page circular, in which it is stated that during this period discounts will be allowed from the store's regular retail prices, orders being taken for immediate or future delivery. Assurance is also given that no special or inferior goods have been purchased for this sale and that the goods offered are from regular stock. Referring to the purpose of the opening the firm says:

Good advertising brings good results. The best advertisement for a good business is good public senti-

among as many homes in the county. The catalogue illustrates selections from the company's large stock of Vehicles, Farm Implements and Hardware. In the introductory reference is made to the fact that the catalogue is very far from being a complete representation of the extensive variety of goods to be had at the store, but it is hoped that it "will be as a guideboard to the traveler and direct thousands of people to visit the store during the coming season." "In this manner" the firm trusts "not only to strengthen the ties between the patrons of the store and ourselves, but by fair and courteous treatment to gain new customers, who will find it both pleasant and profitable to deal with us."

HARDWARE AND TOOL WINDOW DISPLAY.

MILTON ROGERS & SONS COMPANY, Omaha, Neb., dealers in Hardware, Stoves, Furnaces, Mantels, Tiling, House Furnishings, &c., recently dressed their show window, as here given, to attract the notice of passers-by. The background was formed of maroon and dark

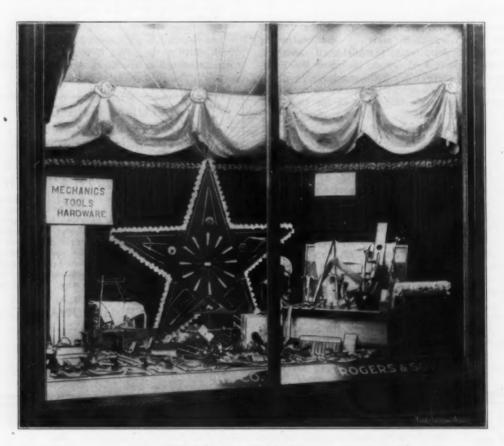
red material resembling cheese cloth, draped on a light frame work of wood, which was inexpensive to make. The light colored drapery above was of a maroon color, although showing light in the picture. The lower and principal portion of the drapery was red in color, and the bottom of the window was covered with maroon colored cloth on which the many Mechanics' Tools and articles of Hardware were artistically arranged. The star consisted of wood frame work and pasteboard covered with a dark red cloth, having a border of white puffing. The cord above, radiating fan like, is trot line, the remainder of the

goods should be plainly ticketed as broken lines reduced in price. It is sometimes very effective to place a card in the window announcing that the prices quoted have been reduced because assortments are not complete, and

Odd Goods Window Display

that there are no duplicates in the store at the same figures. Such an announcement, tersely worded, often induces a person to act at once,

whereas if the announcement did not appear the buyer might procrastinate. In some stores there are small windows which are admirably suited to this class of dis-



Window Display of Hardware and Tools.

ball not used being dropped behind the star. The exhibit, which was well arranged and attracted much attention, was prepared by J. M. Jackson.

POINTERS FOR HARDWAREMEN.

BY "ON THE ROAD."

Progressive houses will very seldom entertain a proposition to display old goods or broken assortments in their windows. This is largely due to the belief that the window reflects the character of the store, which is does beyond a doubt, but, nevertheless, the window display can often be used with great effectiveness

in moving goods of this description. This will be found particularly true of bulky merchandise which cannot find a place upon the special or bargain tables in the

store. It is not necessary nor advisable to devote the entire window display to this sort of an effort. A small window can be used for this purpose, or a limited space can be divided off in one of the large windows.

Because of limited quantities displays of odd goods cannot be arranged elaborately. In many instances there are no duplicates of the goods within the store, and inquirers must be satisfied by taking merchandise from the window to be shown. This would be a serious matter if the display were complicated or difficult of access. The

play, and in such instances these windows can be permanently used as a clearing announcement. Various assortments become broken from day to day, some goods get slightly damaged, some may be slow sellers; yet every one of them can be moved at the right price, and the window is a good place to let the public know about the offers.

The question has been raised as to why odd goods or broken assortments cannot be sold by advertising them in the local papers. So they can be. But when quantities are small it is seldom advisable to advertise them at reduced prices in the newspapers, where hundreds and thousands of readers are likely to see the announcement. If people respond to such an advertisement after the goods are sold there is bound to be disappointment and a corresponding undesirable impression of the store.

Window Better tise any line of goods which will not last until all inquirers are satisfied. When these small broken

isfied. When these small broken lots are shown in windows they are taken from view at once when they are sold, and therefore cannot mislead people into coming to the store for nothing, or give any one an opportunity to accuse the management of misrepresentation. While it is not good policy to indulge too often in this class of display at the expense of new goods, still an occasional effort in this direction is bound to prove effective if it is conscientiously carried out.

TRADE ITEMS.

THE ESSEX MFG. COMPANY, 210 Madison street, Chicago, has been incorporated, with a capital stock of \$25,000, to manufacture metal specialties, chief among which will be a Roof Fastener, the invention of Frank S. Howard. The company will start with a small shop and is having a special automatic machine made for the manufacture of the Fasteners. This machine will turn out 35 Fasteners a minute. The incorporators of the company are Frank S. Howard, Samuel J. Lumbard and J. W. Burdette.

At a meeting of the stockholders of the New Castle Forge & Bolt Company, New Castle, Pa., held on March 27, it was decided to issue bonds to the amount of \$75,000 to furnish additional working capital to take care of the greatly increased business and to make some improvements to the plant. This company reports that it is now doing treble the business of last year and contemplates running its plant double turn.

THE NEW YORK ALUMINUM COMPANY, formerly at 338 Broadway, New York, with factory at Newark, N. J., has been reorganized under the name of Aluminum & White Metal Mfg. Company, with office and salesroom at 336 Broadway. The new company's specialty is Spinning, Stamping and Casting in pure aluminum and all kinds of white metal goods. Advertising Novelties and Specialties made to order will also be a feature of the business.

James L. Neefus, 52 Dey street, New York, is the sole selling agent for New York, vicinity and export, for Lincoln-Williams Twist Drill Company, Taunton, Mass. A good line of the company's product is carried in stock at the above address. A new list of high speed Twist Drills has just been issued, containing 76 sizes, ranging from 3-16 to 3 inches and listed from 90 cents to \$75 each, taking Nos. 1, 2, 3, 4 and 5 shank, taper or straight. The company also makes in the high speed Twist Drills jobbers' and machinists' sets, and the letter sizes and the numbered sizes, 1 to 52 gauge.

THE STANDARD SCREW COMPANY held a meeting at Jersey City March 30, at which it was voted to increase the company's capital stock from \$1,500,000 to \$4,500,000. This increase was made necessary by the purchase of the plant and business of the Hartford Machine Screw Company, Hartford, Conn., and that of the Western Automatic Screw Company, Elyria, Ohio, the price paid for the two properties being \$1,900,000. Details of this sale were printed in *The Iron Age* of March 23.

The firm of O. Chan. Wells & Wm. A. Locke, who deal in Iron, Steel, Copper and Brass at 100 William street, New York, has changed its name to Wells & Locke. Mr. Wells says while he never considered the former title euphonious or convenient, he did not appreciate how outlandish it was until the firm began to receive mail addressed in a fashion which promised no end of combinations and distortions, humorous and otherwise, as a result of the peculiarity in style.

THE NEW CENTURY MFG. COMPANY has removed from New York City to Rochester, N. Y., where all the stockholders reside, and the company will be reorganized in the near future. The company manufactures the Steel Giant Grubber, which is designed for the extermination of sprouts, saplings, brush, bushes, small trees, &c., while fence posts may also be raised out of the ground by its use.

Whitfield Hardware Company, Hawkinsville, Ga., has leased the Stetson Block in that place, and is remodeling it with a view to removing the business there on completion of alterations and improvements. The new premises will materially enlarge the company's facilities, which have been for some time inadequate for the proper and convenient handling of its business. They will also enable the firm to add to the number and assortment of lines carried. Warren shelving will be installed in the new store, which will contribute much to the attractiveness of the interior.

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LANDERS, FRARY & CLARK'S NEW YORK HOUSE.

ANDERS, FRARY & CLARK, New Britain, Conn., whose New York offices and showrooms have been at 82 Chambers street for a number of years, have leased an entire floor in the Vincent Building, corner Broadway and Duane street, two blocks from their present location, and will remove there about May 1. The showrooms will be handsomely fitted up with new sample cases and tables that will display their goods to much better advantage than heretofore, and will be divided into three departments-one for an elaborate display of their Table Cutlery, one for the line of Household Hardware Specialties and one for office purposes, thereby providing much better facilities for their increasing export and home trade. It will be recalled by the trade that the new location adjoins that of their former New York office, occupied by them for about a quarter of a century, and which they vacated when the old buildings were razed to make room for the present fine modern structures on the entire block.

JOHN S. LENG'S SON & CO.'S NEW CATALOGUE.

I OHN S. LENG'S SON & CO., 33 Murray street, New York, have just issued an illustrated catalogue of Bicycles, Tires and Bicycle and Automobile Supplies that is especially helpful to the dealer. In the 104 pages of compact matter is shown an immense assortment of these goods, but with list prices only, a separate booklet of 56 pages giving discounts, both trade and cash, and the net prices in detail for each article figured out for the convenience of the buyer, who thus sees exactly what each item nets. Many new illustrations appear throughout the book, detail cuts, enlarged, showing the heads of Bicycles, front view, sections of Tires, &c. A special feature is made of Automobile and Carriage Spokes and Nipples, French Horns, Regal Cement, Standard Spring Cotters and other goods, the house carrying large and complete stocks of Bicycle and Automobile Supplies and Accessories.

HURTY-SIMMONS HARDWARE COMPANY.

In connection with the establishment of branch houses in different sections of the country by the Simmons Hardware Company, St. Louis, Mo., which has been going on for some months, it is interesting to note that the house at Minneapolis, Minn., will be organized under the style of the Hurty-Simmons Hardware Company, with F. W. Hurty as manager. Mr. Hurty is well known to the trade of the Northwest as a former member of Farwell, Ozmun, Kirk & Co. of St. Paul, and is recognized as a Hardwareman of much practical experience and ability.

The Bridgeport Hardware Mfg. Company, Bridgeport, Conn., has purchased from the Knapp & Cowles Mfg. Company, also of Bridgeport, which has gone out of business, its entire stock of raw material, forgings and partly finished goods, as well as all Dies, Tools and appliances formerly used in the manufacture of Screw Drivers, patent rights together with the exclusive right to use the Knapp & Cowles name, special brands, trademarks, labels, designs, &c. The Bridgeport Hardware Mfg. Company will continue to make the leading styles of these Screw Drivers, the quality of which will be fully maintained. Having quite a large stock of nearly all sizes the company is in a position to fill orders with reasonable promptness.

THE KELLY AXE MFG. COMPANY, which recently removed its large plant from Alexandria, Ind., to Charleston, W. Va., will soon have the entire works in full operation. The manufacture of Scythes was begun at Charleston several months ago, and last week the first Axe was turned out in the new plant. Work on all the new buildings has been pushed as fast as possible, and it is

expected that by July 1 the entire plant will be in full operation.

NORVELL-SHAPLEIGH HARDWARE COM-PANY'S BANNER MONTH.

NORVELL-SHAPLEIGH HARDWARE COMPANY.
St. Louis, Mo. in a and addressed to its traveling salesmen and house employees, announced that March was a record breaking business month for the house, more goods having been sold during that period than ever before in the history of the company. The letter is decorated with American flags, and to celebrate the month's results Saturday, the 1st inst., was observed as "Flag Day." On the morning of that day every house employee found on his or ber desk a little American flag, while flags were also sent to the outside salesmen by mail, this being intended to emphasize the company's appreciation of the help and co-operation of its employees. The letter closes with an appeal for a record breaking April. The manner in which the matter is treated is certainly admirably calculated to cultivate an esprit de corps and develop a spirit of enthusiasm in the employees.

RETIREMENT OF GEORGE REUTER, JR.

THE trade will regret to learn of the temporary retirement of George Reuter, Jr., general manager treasurer of the American Wringer Company. Owing to the strain of the past two years Mr. Reuter determined on this step a year ago and notified the company that he wished to retire for a rest December 31 last. Nevertheless he was re-elected in January, but on March 7, by the advice of his physician, Mr. Reuter again tendered his resignation to become effective April 1; but the company requested him to remain until May 1, which he has consented to do. At a meeting of the Board of Directors of the American Wringer Company, held March 21, a resolution was adopted reviewing Mr. Reuter's relations with the company and expressing its regard and appreciation of his marked ability as a business man. A hope was also expressed that he would still remain in the directorate, pending his restoration to health. Mr. Reuter will enter upon his well merited exemption from the cares of business with the best wishes of a bost of friends.

J. H. WILLIAMS & CO.'S NEW FACTORY.

THE employees of J. H. Williams & Co., Brooklyn, manufacturers of Drop Forgings, celebrated April the approaching completion of the fine new large brick building adjoining the rest of their plant at the intersection of Hamilton avenue and Richards street. By permission of the municipal authorities Bowne street was closed and the property purchased, which, with the large area south of the present office, gave them a suitable site for a four-story and basement building, which is a model in practical mill construction of modern type. A feature of the occasion, participated in by about 700 persons under the auspices of the Mutual Aid Association, was the presentation to the company by the employees of a national flag, 15 x 25 feet, which was accepted by William C. Redfield, who succeeded to the presidency of the company after the decease, recently, of J. H. Williams, who founded the business. There was a fine social programme, music, dancing and a collation.

We are advised that a company is being organized at Savannah, Ga., to be known as the Southern Axe & Tool Company, incorporated and capitalized at \$100,000, for the manufacture of axes and tools, especially tools used in the turpentine industry. N. J. Sager, formerly of the Sager Axe Company, and a number of Southern capitalists are the incorporators. Mr. Sager, who is an expert in this class of goods, and inventor of the Sager Axe, well known in the South, and who has had years of experience in this line, will superintend the manufacturing. The capacity of the plant will, it is estimated, be 1000 axes per day, besides other tools.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, and are referred to the manufacturers.

From Akron Hardware Company, Akron, Ohio, which has been incorporated with a capital stock of \$10,000, to carry on the general Hardware, Buggy and Wagon and plumbing business.

From Martin Brothers, Canton, Mo., who have succeeded J. Martin & Sons in the Hardware business.

From Wolf & Pittman, Annona, Texas, successors to Wolf & Thompson in Hardware, Tinware, Harness, &c.

From the Gilbert-Sturtz Hardware Company, Arkansas City, Kan., which has succeeded Gilbert & Sturtz in the wholesale and retail Hardware, Stove, Paint, Sporting Goods and plumbing business. Mr. Gilbert disposed of his interest in the former firm to Mr. Sturtz and has retired from the Hardware line to take up banking.

FROM BATEMAN HARDWARE COMPANY, Salida, Col., which has lately removed to new quarters, where it has double the former floor space. In connection with the general Hardware business is a plumbing and heating department.

FROM GREENWOOD HARDWARE COMPANY, Greenwood, S. C., which has increased its capital stock from \$5000 to \$20,000. The company does a wholesale as well as a retail business and now occupies a new store.

FROM THE LAWRENCE HARDWARE COMPANY, Sussex, N. J., which has opened a branch store at Butler, N. J., and requests catalogues covering general Hardware, plumbing, &c.

From G. A. Gove, who is about to open a store at Beverly, Mass., handling Shelf Hardware, Agricultural Implements, Paints, Sporting Goods, &c. Mr. Gove was formerly secertary of the Hamilton Hardware Corporation of Waterbury, Conn.

FROM F. H. TURNER & Co., Great Barrington, Mass., who have bought the business formerly conducted by John A. Brewer. The new firm consists of W. B. Turner, F. H. Turner and F. E. Giddings, the latter formerly identified with Mr. Brewer. F. H. Turner was formerly a member of the firm of Platt & Turner. The new firm will double the stock in many lines.

FROM HIMES & PHILLIPS BROTHERS, Wilson, Kan., successors to F. P. Himes in the general Hardware business.

FROM C. W. AVERILL & Co., Barre, Vt., who have succeeded Prindle & Averill in the Hardware, Stove, Paint and plumbing and heating business.

From Frank S. Rainey, Pueblo, Col., who has lately opened up in the Shelf Hardware, Stove, Tinware and Sporting Goods business.

From W. L. Monger, Oakville, Iowa, who has bought the Hardware, Stove, Implement and Paint business formerly conducted by S. V. Dunham.

From A. H. Heyden & Brother, Benson, Neb., who have lately embarked in business as merchants in Hardware, Stoves, Tinware, &c.

From A. N. Matthews & Son, Eureka Springs, Ark., successors to Matthews & Hawkins in Shelf and Heavy Hardware, Stoves, Implements, Paints, wagon materials, furniture, carpets, &c.

FROM EARL L. Woods, Hesston, Kan., who has succeeded Cummings Brothers in the Hardware, Implement and Harness business. Mr. Woods is from Clay Center, Kan., and formerly traveled for the Faeth Iron Company of Kansas City.

NOTES FROM SOUTH DAKOTA.

The senior member of the firm of Carroll & Miller, Hardware dealers at Lebanon, S. D., has sold his interest in the business to Francis Miller, a brother of John Miller, the junior member of the firm, and in future the business will be conducted by the Miller Bros.

E. F. Gross, a pioneer Hardware dealer of Gettysburg, S. D., has remodeled the interior of his store building and fitted it up with new cases and counters and added other improvements and conveniences. He now has one of the finest Hardware stores in that part of the State.

Charles Maxwell, Scotland, S. D., has disposed of his Hardware store to Daniel, Charles and Jacob Rembold, who will continue at the old stand.

After being engaged in the Hardware business at Kimball, S. D., since 1883, George W. James has sold his business to Brooks & Brochan, a new firm. John Brooks and Joseph Brochan, the members of the new firm, for some years were engaged in the stock raising business near Kimball.

Hubbard Bros., Farm Machinery and Hardware dealers, of Henry, S. D., have dissolved partnership. C. V. Hubbard purchased the full interest in the Hardware business, while R. E. Hubbard will in future be the sole owner of the Farm Machinery interest.

W. H. Bennett & Co. is the name of a new firm that has engaged in the Hardware business at Castlewood, S. D. The members of the firm are W. H. Bennett and F. S. Patterson, formerly of Watertown, S. D.

Gaughen & McKee, Hardware dealers, Bonesteel, S. D., with branch store at Gregory, a new town in the ceded lands of the Rosebud Indian reservation, will erect a fine new building in the latter place.

Kittel Hagen, Webster, S. D., has purchased from Lensgrav Bros. their interest in the Farm Machinery business and will occupy a part of their building with the stock. The remainder of the building will continue to be occupied by the Lensgrav Hardware stock.

Preparations are being made by Farnslow Brothers, Farm Machinery and Vehicle dealers of Yankton, S. D., to erect a large warehouse during the coming season. The new building will be of brick and cement. It will be 44 x 110 feet in size, and three stories high, with basement which will extend the full length of the building and to a hight of 3 feet above the surface of the ground. The ground floor front will be of plate glass. This floor will be used chiefly for display purposes. When completed the structure will be one of the largest and finest of its kind in South Dakota.

The firm of Bork & Hanson, Byant, S. D., for some years engaged in the Hardware business at that place, has gone out of existence, having disposed of the stock to Thompson & Larson and E. S. Dunn & Co. of Byant.

J. F. Bigelow, Worcester, Mass., manufacturer of the Bigelow Wire Fly Killer, which has been on the market for some time with increasing success, is offering the article for this season packed in boxes of one dozen each, and shipped in one, two, three and five gross cases. The manufacturer issues attractive printed matter for retailers' use, also furnishes a handsome display stand free. We are advised that the trade for these articles abroad is increasing, and that shipments have recently been made to Mexico and other Southern countries.

NEW ORLEANS NOTES.

FROM A SPECIAL CORRESPONDENT.

PERHAPS the most striking feature of the revivified commercial life that has come to New Orleans within the past six weeks or two months has been the sudden and almost totally unexpected increase in the total volume of Hardware business that has been transacted out of the city within the last 20 or 30 days. Hardware merchants, jobbers and retailers, unite in expressing surprise at a condition of affairs that has surpassed their anticipations from 10 to 12 percent. While this does not apply uniformly to all Hardware lines, the totals are such that the average of business just now is variously estimated at from 3 to 5 per cent. ahead of last season at the same time.

This is deemed all the more remarkable in view of the fact that January fell behind the January of 1904, and that February gave little if any promise of doing better in proportion. In fact January was the bluest month that the Hardware trade has witnessed in more than three years, and the outlook was gloomier than any save a very few Hardware merchants would admit. The renewed life is said to be due largely to three great causes. The cotton country, having narrowly escaped a panic in late December and January, and having stunted itself beyond measure during those months, is just now undergoing a reaction. Credits have been readjusted for the ensuing year. Bankers and merchants are confident that their risks are sure and safe. In consequence the planters are just now rather making up in their purchases for the skimping of the two sad months noted. The second cause is the continued unexampled prosperity of the sugar planters. They are largely buying on their prospects for the ensuing season. Rice planters are buying little, but the timber district has developed an unwonted activity since the opening of the new agricultural and business year that commences down here on March 1. Taken with all this, export trade continues to develop In a way that is gratifying to the men who have for so many years sought to bring about better trade relations between the Spanish Americas and New Orleans.

Goods Selling Best.

Perhaps the leading line just now is builders' materials and supplies. This is due to an unprecedented activity in local building, and to a boom in the same direction through the regions devoted to cane, cotton and timber. In New Orleans alone, counting the Illinois Central contracts at Stuyvesant Docks and the 'Frisco contracts at Chalmette, there will be spent within the next 14 months at this point in high grade construction requiring vast quantities of mill supplies, Builders' Hardware, &c., fully \$11,000,000. Just what this means to the trade is best understood when it is remembered that during 1904 the total building permits issued were for \$4,500,000. Through a number of towns and smaller cities near New Orleans there is much building going on. Through the timber belt there has been contracted for several hundred miles of railroad construction, and this is doubled by the work of the 'Frisco system and of the Louisiana Railway & Navigation Company. The season closing March 1 witnessed the largest mill supply business ever done in the city.

Farming Implements are going out with greater volume than was anticipated a month ago and the cotton planters are buying with a freedom that does not indicate any reduction of acreage. Cane district jobbers are buying fully 20 per cent, more than they did at this season in 1904—for one year ago their customers were broke, and now they are more prosperous than in 20 years before. Household supplies and general Hardware are both going well to the local demand. Nails have been selling strongly and uniformly to all sections. Sheet Metal Roofing is a particularly popular line, especially to the city trade and to the cotton region.

Export and Transportation Developments.

There has been through several months a steady development of the export trade, this being aided as much by the moral effect of the recent establishment here of a

purchasing agency for the Panama Canal Commission as by anything else. Buyers from the Spanish Americas have been frequenting the city a good deal during the past month.

Of recent interest in this connection was the decision by the purchasing agents of a number of the largest sugar estates in Cuba to place their orders for farm machinery, mill supplies and builders' supplies for some large sugar houses, soon to be erected in Cuba, with New Orleans houses.

Nicaragua and all the Central American countries have increased their Hardware and farm machinery purchases by about 15 per cent., compared with 1904. Recently the United Fruit Company has added to its Spanish American freight and passenger service, the Morgan line has added to its Cuban freight service, the Munson line has decided to install a freight and passenger service to Southern Cuba, and the Mexican American line has added to its facilities—thus increasing very perceptibly the ease of communication to these several countries.

Two weeks ago Stauffer-Eshleman & Co. purchased a bit of property adjoining their present site in Canal street, near the Custom House, for \$62,500, and on this lot and the one now occupied by them they will erect during the spring or summer an establishment with a depth of an entire block on one street, a frontage of half a square in Canal street, and width of the same on the street behind Canal, giving access to the Public Belt road that will soon be constructed.

A. Baldwin & Co. have practically completed demolishing the old building of the New Orleans Railway & Mill Supply Company and will soon erect a new warehouse on the trunk line of the Illinois Central road.

The United Hardware Company has been successful recently in a number of bids made for materials to be supplied the Board of Commissioners of the Port of New Orleans for improvements on the river front.

J. D. WARREN MFG. COMPANY.

D. WARREN MFG. COMPANY, Chicago, Iil., has just issued an attractively illustrated folder entitled "The New Partner," the latter having reference to the complete equipment for Hardware stores of which the company makes a specialty. The illustrations, in colors, show eleven combinations of the Warren shelving, the remaining picture being of one of Warren's Builders' Hardware cabinets. The illustrations are accompanied by full details, giving dimensions, weights, &c., of the fixtures. Larger size illustrations of any cabinet or base, separate, will be sent on request.

Addressing the trade in an introductory under the title of "Out of the Bogs of the Past," the company, remarking that the financial success of every merchant depends on profitable selling, makes the point that goods become self selling if attractively and invitingly displayed in such a way that they appeal to and fascinate purchasers, begetting a desire to possess them. This presentation of them, it is suggested, is admirably done through the Warren equipment, which embraces everything from the cheapest drawer up to the most elaborate design.

SHADBOLT & BOYD IRON COMPANY.

Mis., has just issued an illustrated catalogue and price-list containing 862 pages, devoted to Iron and Steel, Blacksmiths' and Machinists' Supplies, Heavy Hardware, Wagon and Carriage Hardware, Carriage Makers' and Blacksmiths' Tools, Carriage Trimmings and Mountings, Paints and Varnishes, Wagon and Carriage Wood Work and hardwood lumber. The company refers especially to its excellent facilities for handling hardwood lumber and wagon stock, of which a very large assortment is carried.

Charles Lindekugel, Spencer, S. D., has purchased the Hanson Implement business at Farmer, S. D., and will conduct it in future.

NEW YORK AND NEW JERSEY, HARDWARE AND IRON ASSOCIATION.

MEMBERS and friends of the New York and New Jersey Hardware and Jron Avenue Jersey Hardware and Iron Association to the number of 35 attended the sixth annual banquet of the association at Hotel Vendome, New York, on the evening of March 30. After the menu had become a table of contents, Wm. E. Kleine, toastmaster, stated that formal speeches had been tabooed and that anything in the nature of seriousness would subject the perpetrators to the displeasure of the banquet committee. At the call of the company for M. Eisig, that gentleman was induced to respond with a few well chosen words regarding the various phases of after dinner speaking. He concluded his address with an original humorous poem, entitled "Things I Have Missed." These included unpleasant incidents which he had averted or overcome during his business career. Among other features of the entertainment were instrumental and vocal selections by a colored quartette, solos by Sam Speck, singing by the association members and their friends, recitations by George H. Ruwe and by a professional entertainer. A portion of the menu was devoted to two songs, one to be sung to the air of "Mr. Dooley," in which characteristics of the officers and some of the members were exposed in a humorous light. The other song, sung to the air of "The Man Behind," was as follows:

It is once a year we get a meal, 'tis all we can afford, And then we get together 'round the gay and festive board. Returning good for evil done, we ask our friends to dine, They're our enemies in business in the manufacturing line.

Chorus :

They're not behind, they're not behind,
They're the smoothest chaps that you will ever find,
They are always on the watch, just to raise the price a notch,
They never want to be the man behind.

Oh! the Wheel men come and visit us and ask about our needs, And talk about scarce timber to excuse their wicked deeds. When they get home they figure up just what the trip has cost, Then they cut the dealers' discounts to make up what they lost.

Then the Bolt man says, "It's time to buy, the price will rise

sure pop."

And when you get your stock all in it's very apt to drop.

The Steel and Iron men will say, "It is no time to buy,"

And almost before you've time to think, the price is up sky-high.

And the Axle man surveys the field when Iron prices slump. That fact does not disturb him, for he makes his prices jump. You ask him "Why and wherefore thus?" and then perhaps he'll squirm.

"Old man, you know too much; buy stock and And he'll say,

join my firm.

The association has chosen the following officers and Board of Directors for the ensuing year: Joseph Ruppert, president; J. H. Ruwe, vice-president; Henry Bodevin, secretary; Emil Rudolph, treasurer; J. T. Doremus, P. C. Quackenbush, Ralph H. Tiebout, Walter T. Crane and Wm. E. Kleine, directors.

SOUTHERN HARDWARE JOBBERS' ASSO-CIATION.

MEETING of the Executive Committee of the South-A ern Hardware Jobbers' Association was need at Knoxville, Tenn., on the 22d and 23d ults., at which the ern Hardware Jobbers' Association was held at matter of programme for the coming annual meeting of the association at Virginia Hot Springs, June 6-9, was principally discussed. Among the subjects decided upon for discussion at the convention are restricted prices, mutual fire insurance, increased expense of doing business, postal laws and reduction in letter postage, Southern manufacturing advantages and opportunities and manufacturers' encroachments on the jobbing trade. The committee is much gratified with the bright prospect for a large and successful gathering. The railroads of the South have granted a rate of one fare for the round trip; from other sections the rate will be fare and a third.

GEORGE S. KNAPP, Bridgeport, Conn., manufacturer of Bullard's Improved Carpet Stretcher, is sending out circulars to the trade calling attention to the fact that he does not sell this Stretcher to catalogue houses. The Carpet Stretcher is made in a substantial manner and is said to work very effectively. It weighs but 10 ounces.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, pricelists &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

THE GENERAL FIRE PROOFING COMPANY, Youngstown, Ohio: Postal circular relative to All Steel Wardrobe Lockers, designed for factories, schools, gymnasiums, stores, banks, &c.

THE BERGEB MFG. COMPANY, Canton, Ohio: Illustrated catalogue of Office Sectional Filing Cabinets, constructed of sheet steel, brass or bronze and malleable iron. The company also manufactures, along the same line, Roller Shelving, Vault Omnibuses, Cupboards, Card Index Drawers, Roll Top Desks, &c., of Steel.

BUTLER BROTHERS, New York: Catalogue No. 533, prices of which went into effect March 27 and supersede all others. The goods shown include a variety suitable for the retail Hardware trade, on which net prices are

NATIONAL FEED BOX COMPANY, Detroit, Mich.: Circular describing and illustrating the National Feed Box, and giving reasons why it is desirable for horses' use.

SILVER LAKE COMPANY, Boston, Mass.: Catalogue and price-list devoted to Rope, Sash Cord, Railroad Bell Cord, Trolley Cord, Masons' Lines, Chalk Lines, Clothes Lines,

THE E. F. REECE COMPANY, Greenfield, Mass.: Illustrated circular relating to the Reece Screw Plates, Adjustable Guide Stock, Hand Taps, Machine Nut Taps, Bolt Cutter and Nut Tapper, &c.

MILNE MFG. COMPANY, Monmouth, Ill.: Illustrated catalogue relating to Grub and Stump Machines and other appliances for clearing timber land.

GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, Wis.: Illustrated price-list pamphlet, devoted to Tin, Galvanized and Japanned Watering Pots.

DIEHL MFG. COMPANY, Elizabethport, N. J.: New York office, 561-563 Brodway: Electric Fans for all currents except alternating, including ceiling, electrolier, column, universal desk and telephone booth Fans. These are shown in Catalogue No. 16, together with Fan Motors, Ventilating Outfits and Exhaust Fan Outfits, Small Motors for Sewing Machines. &c.

N. R. Davis & Sons, Assonet, Mass.: Catalogue illustrating and describing various grades of Davis Hammerless and Hammer Guns.

C. D. EDWARDS, Albert Lea, Minn.: Illustrated pricelist of Grub and Stump Pullers, Ditching Machines, Road Levelers, Bog Land Cutters, House Moving Capstans, &c.

C. T. HAM MFG. COMPANY, Rochester, N. Y.: Booklets devoted to the company's extensive line of Lamps and Lanterns, including Ham's Auto Cold Blast Lamp and Cold Blast Runabout.

McLennan Paint Company, Buffalo, N. Y.: Folder calling attention to the company's Onyx Paint Products, including Enamel, Screen Paint, Floor Paint, Carriage and Wagon Paints, Floor Finish, Barn and Bridge Paint, Sanitary Inside Enamel Paint, &c.; also a booklet entitled "Paint and How to Use It."

Belding-Hall Mfg. Company, Chicago: Catalogue of Stove Boards, including Mosaic Boards formerly made and Persian Enameled and Enameled Crystallized Boards, which have been added for the season of 1905. Accompanying the catalogue is a booklet calling attention to the company's new Linoette Enameled Fiber Stove

MAST, Foos & Co., Springfield, Ohio: Catalogue No. 25, descriptive of the Buckeye Lawn Mowers, including the Foremost, the Mascot, Buckeye Special, Buckeye Junior, Buckeye High Wheel, Buckeye Standard and Royal Buckeye, the two latter machines having been added for the season of 1905.

Cooper & McKee, 119 Lorimer street, Brooklyn, N. Y.: Illustrated price-list pamphlet devoted to Opalite Glass Lined Refrigerators. Various sizes and styles have oak cases, and one size has the outside and inside of glass.

LAWSON MFG. COMPANY, 40 Dearborn street, Chicago, Ill.: Folder illustrating the Matchless Double Acting Floor Spring Hinge and Automatic Burglar Proof Window Ventilating Lock.

Weed & Co., Buffalo, N. Y.: Extra pages of recent new and revised list prices for insertion in their catalogue.

THE H. D. SMITH & Co., Plantsville, Conn.: Illustrated catalogue relating to Vehicle Drop Forgings, Special Drop Forgings, Drop Forged Screw Driver Bits and Screw Drivers, Brick and Masons' Trowels.

PLEUGEB & HENGEB MFG. COMPANY, St. Louis, Mo.: Catchy envelope slips calling attention to the special features of the company's Cactus and Japanese Adjustable Lawn Sprinklers.

Voss Bros. Mfg. Company, Davenport, Iowa: Circular descriptive of the Ocean Wave Washer.

MISCELLANEOUS NOTES.

Carbo Anti-Rust Razors.

Sage & Hatch, Bridgeport, Conn., manufacturers and sole sales agents of the Carbo Anti-Rust razors, state that these razors are guaranteed not to rust, being treated by a special process. They also claim that their special process of making conduces to produce a razor that will hold a keen cutting edge for a long time. This firm are catering especially to the retail hardware trade and the Carbo Anti-Rust Razor is one of their new products. They will be glad to send full particulars to the trade on inquiry.

Hawkeye Gas Fitters' Handy Wrench.

Hawkeye Wrench Company, Marshalltown, Iowa, Is putting a new style wrench on the market, No. 300, similar in appearance to its Hawkeye wrench, but designed for the use of plumbers and gas fitters. The dies in the wrench will clean up threads on three sizes of pipe. The jaws are adapted to pipe and nuts.

Harp Lamp with Ideal Fount.

Edward Miller & Co., Meriden, Conn., and 28-30 West Broadway, New York, have just begun the manufacture of the Harp lamp with No. 3 Ideal mammoth fount here



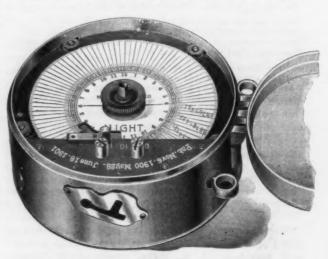
Harp Lamp with Ideal Mammoth Fount.

shown. This hanging lamp is designed especially for the hardware trade and is packed complete one in a box. The lamp is particularly suitable for use in stores, halls, churches, factories, club rooms and kindred places. The Ideal wick lift consists of a metallic perforated wick sleeve which fits over outside of wick, the cogs of spindle working in the perforations of wick sleeve in the operation of raising and lowering the wick, this 'mportant part of the lamp mechanism meeting the approval of the

Standard Oil Company. The lamp furnishes a 300 candle-power light, lasting 12 hours with one filling. The length of harp with fount is 35 inches. The lamp is equipped with their No. 162 harp and No. 138 20-inch tin reflector, with fount and other parts of polished brass or nickel finish. This kind of reflector is less liable to injury than the glass dome shades, but for those requiring such the same lamp is obtainable with a 14-inch plain opal dome shade at a moderate advance in cost. A No. 28 patent spring extension is made, suitable for hanging the lamp where it is desired to raise or lower the lamp, which can be hooked in the eye of the harp, but is not sent unless specially ordered.

Newman Watchman's Clock.

The clock shown in the accompanying cut, offered by the Newman Clock Company, Masonic Temple, Chicago, Ill., is carried by the watchman, and the keys to operate are chained to the stations to be visited by the watchman on his rounds. The clock contains a paper record dial with figures for either 12 or 24 hours. The dial lies on top of a female die or matrix containing a series of numbers and letters in a straight line, the usual equipment being either 9 or 16 characters. Each character corresponds to a station to be visited by the watchman, and at each station is secured a key chained in a small metal box securely fastened to a post or wall. The key contains a male die of the letter or figure corresponding to the designation of the station, the position of the letter or figure on the face of the key corresponding to the posi-

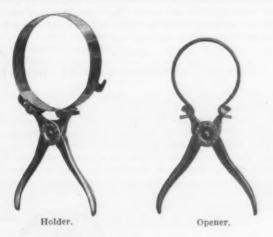


Newman Watchman's Clock.

tion of the same character on the row of female dies on the matrix under the paper record or dial. The dial revolves by a timed movement, and when the watchman inserts and turns the station key in his portable clock it presses the paper into the reverse die below and makes a record that shows the hour and minute at which the watchman made the record. In a plant where the stations are spaced so that they can be reached at equal intervals the records of the watchman would consist of a straight row of figures as shown on the face of the dial illustrated. The superintendent or proprietor, in looking over the record, can therefore determine at a glance whether his watchman has faithfully and punctually made his rounds, and in case of a fire or accident in any part of the plant can determine by the record just where the watchman was at the moment of the incident. Provision is made for preventing effectually the duplication of the keys, and for watchmen in the same plant conspiring to relieve each other. Neither can the watchman open or tamper with the clock without leaving a telltale perforation on the dial. Should a watchman conclude to rush his round in a few minutes, in order to get time to loaf, the record will show that, too. In every detail the device has been perfected and safeguarded with the view of making it impossible for a dishonest watchman to take advantage of it, at the same time recording the faithful service of the conscientious watchman.

The Wolverine Fruit Jar Holder and Opener.

The accompanying cuts represent a fruit jar holder and opener which is being introduced by the Wolverine Supply Company, Pittsburgh, Pa. The holders and openers are nickel plated and polished; are adjustable for



The Wolverine Fruit Jar Holder and Opener.

pint, quart and half gallon jars; fit the hand comfortably, and are referred to as being high grade in every respect.

Farny Razor Sharpener.

F. Alfred Reichardt & Co., 391 Broadway, New York, makers of fine surgical instruments and metal goods, are manufacturing the Farny razor sharpener, here shown, the careful construction of which from high grade material enables even inexpert laymen to scientifically sharpen a razor. The blade is held in the vise of a steel cradle fastened to a movable stage and centered by two specially drawn nickel steel wire springs, exactly alike, under the platform of the razor holder. A crank movement turns two wings with sharpening surfaces set at an angle of 10 degrees, as they revolve, always in one direc-



Farny Razor Sharpener.

tion, against edge of blade. Each revolution causes both wings to come once in contact, one after the other, with each side of the razor and glide along its edge; the right wing overcoming the tension of the left spring, passes on one side of the blade, sharpening it, and vice-versa. The result is a mathematically exact sharpening, alike on each side, made possible by evenness of spring pressure and the application of the revolving force always at the same 10-degree angle bevel. Razors thus sharpened require no grinding or honing. The wings of the Farny razor sharpener are made of artificial honing stone, covered on one side with a fine quality of leather treated with a special preparation. Changing the wings to the opposite sides, thereby bringing the black surfaces

in the center, they will grind and hone out nicks. The best results are obtained in connection with high grade razors, extra hollow ground and full double concaved. Safety razor blades are similarly sharpened on this machine by a simple device which serves as a shank to properly hold the blade during the sharpening operation. The Farny razor, full double concave, is made of the finest Swedish steel exclusively for this house by one of the best manufacturers in Germany, and is absolutely guaranteed. To purchasers requiring a complete outfit the accessories of cup, brush, soap and razor can be furnished.

Automatic Numbering Machine.

The Bates Machine Company, 346 Broadway, New York, has recently perfected a new automatic numbering machine, Model No. 49, as here illustrated. This company manufactures a large line of automatic numbering machines for many purposes, even to numbering metal parts, as well as textiles, paper, &c., but this machine is noteworthy for its fine quality, low cost (\$5 retail) and capacity, numbering up to 999,999. The numbers are 3-16 inch high. It will number consecutively from one



123456

Automatic Numbering Machine, Model 49.

up, or it can be set for duplicate numbering, each number printed twice, and then automatically advanced to the next consecutive number, or it can be made for repeating any number as many times as desired before advancing another unit. The wheels and ratchets are divided into equal tenths, and are depressible, thus assuring accuracy of movement. The machines are made with six wheels, and all are engraved with the standard size and style of figures named, which are well proportioned, legible and large enough for most purposes while occupying but a small space. Other styles and sizes can be made to order at an extra charge. The figure wheels are made of a tough composition metal, having wearing qualities of guaranteed excellence, without any of the brittle and adhesive characteristics of cast figure wheels, It weighs but 12 ounces, is 51/4 inches high, operates noiselessly and can be handled with speed and accuracy. The frame is made of drawn steel % inch thick, and excepting handle and wheels, all other parts are of steel, thus securing rigidity and strength with minimum weight. The figures are automatically inked before each impression, from a thick felt pad which can be instantly removed for reinking. An accurate gauge plate assures printing precisely on a line. The machine is made to number consecutively, in duplicate, and to repeat continuously. Machines with letters for serial numbering, either preceding or following the figure wheels, fraction wheels and wheels engraved with any characters required can be made to order. Each special wheel, however, reduces the numerical capacity, as it supersedes a figure wheel.

Globe Lawn Mower & Mfg. Company's Mower.

The Globe Lawn Mower & Mfg. Company, Reading, Pa., is placing on the market an improved lawn mower, as shown in the accompanying cuts. Distinctive features embodied in the machine include an improved

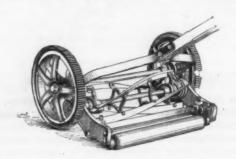


Fig. 1 .- Globe Lawn Mower & Mfg. Company's Mower.

pinion clutch, cone and handle bar fastenings, and patented improved cutter bar adjustment, the latter being referred to as the main feature of the machine. This is shown in Fig. 2, and is so arranged that the cutting bar can be adjusted to the reel blades by a differential

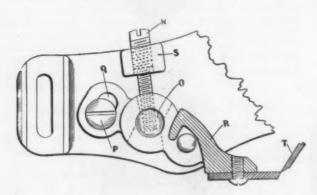
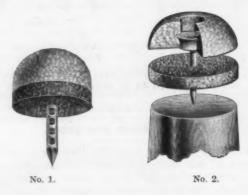


Fig. 2 .- Cutter Bar Adjustment.

screw device so simple that any person can adjust it, it is remarked, with very little trouble. The pinion is so constructed as to give a double bearing, one on each side of the pawl, which is entirely inclosed within the pinion cones the cones will always have a perfect bearing, whether the side frames be in perfect alignment or not, it is explained, because the ball point gives a perfect bearing to the balls, as they must ride in a circle as on a sphere. The handle bar cross piece fasteners are so arranged that the cross piece and handle bar are rigidly held in position, and can be easily tightened in event of their becoming loose. The fasteners are referred to as being simple, ornamental and durable.

Stetson's Combination Cushion Chair Tip.

The tip shown in the accompanying cuts is made of selected sole leather reinforced with metal bushing. No. 1 of the cuts shows the tip ready to be applied with a nail, though a screw may be used instead, if desired. No. 2 illustrates the section of leather and felt used in the tip. The leather comes in contact with the hard wood and marble floors, allowing the chair to move about freely without noise or scratching the floor. The metal



Stetson's Combination Cushion Chair Tip.

bushing is forced into the hole of the leather tip and extends from the bottom of the tip half way and is expanded at the top, which fastens it securely to the tip. When the nail is inserted it allows the tip to have full advantage of the felt cushion. The piece of felt used in the tip, it is explained, furnishes the cushion, which, when applied, is noiseless and elastic the same as a rubber tip. It is pointed out that the combination of leather and felt results in a tip which will not stick to floors. The tips are packed one gross in a box, complete with nails for applying them. The device is offered by

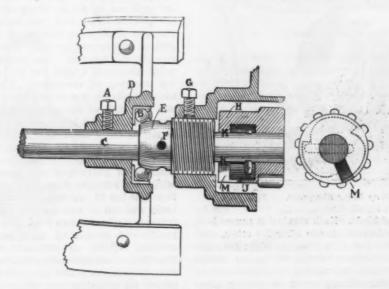


Fig. 3.—Pinion Adjustment,

so as to permit of no dirt collecting and clogging it. The double bearing causes the pinion to remain true on the shaft, reducing to a minimum the wear on gear teeth and pawls. In Fig. 3 is shown a double bearing pinion clutch, H, and the adjustable case hardened ball point steel cones E and the steel balls B. By the use of ball point

the Elastic Tip Company, 370 Atlantic avenue, Boston,

Driske & Smith, Hardware dealers, Northville, S. D., have recently completed extensive improvements to the interior of their store building.

Glass Handled Table Cutlery.

The Goodell Company, Antrim, N. H., and 10 Warren street, New York, has recently put on the market an elegancy in table cutlery mounted with genuine cut glass handles, one pattern of which is here illustrated. In the production of such table ware, ordinarily perishable, the durability of the handles and processes of manufacture are most important. The material for the handle blanks is made after a special formula, and the

&c. The register will record from 1 to 10,000, and any suitable die design can be furnished for the punches, while punches of every description and size can be made to order. A simple locking device, shown in the upper left hand corner of the cut, is attached to the handle by which to lock the punch when not in use so as to prevent its working, which is an important feature. This movement is accomplished by giving a half turn to the reciprocating cam attached to the handle of the punch. When it is desired to bring it into action again another half turn is given, which releases the handle of the





Fig. 2.—Blade of Table Knife.



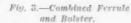




Fig. 4.—Glass Handle,

handles are guaranteed by the company absolutely proof against injury due to changes of temperature, being both tough and strong. The finished article, we are advised, has been frequently immersed in snow and then boiling water immediately poured on it in tests for fracture and without injury. The joining of blade, ferrule and handle (Figs. 2, 3 and 4) is accomplished in a unique and ingenious way. The blade, notched top and bottom (Fig. 2), has a square end that fits perfectly against end of handle, the handle having a tapered end with lugs made in molding the blanks to give additional holding power. The ferrule and bolster combined, drawn from one piece of heavy German silver, with close fitting. rectangular slot to receive end of blade, has a small hole into which molten metal is forced under pressure. In the adjustment of the ferrules just enough play is left to permit escape of air when the hot metal is introduced and so entirely fill the space. The metal used for the union of blade, ferrule and handle is so balanced in composition that in cooling it shrinks only enough to grip tenaciously the united parts, the end of blade having previously been turned to insure cohesion. A further element of strength is afforded by the ferrule ornamentation, the indentations of which receive the hot metal. This line is made in table knives and forks, carving

Woodman's Consecutive Registering Ticket Punch.

sets (knife, fork and steel) and butter knives. The handles are in plain or genuine cut glass, opal, black and opal decorated with flowers, vines, &c., in colors. This ware in the trade will be known as Vitricene table

cutlery.

R. Woodman Mfg. & Supply Company, 63 Oliver street, Boston, Mass., is putting on the market Wood-



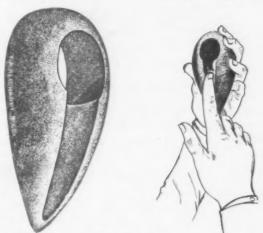
Woodman's Consecutive Registering Ticket Punch.

man's consecutive registering ticket punch here illustrated. It is intended for use wherever time and piece cards are used, as, for example, in canning factories, fruit and other packing establishments, corset factories,

punch. The punch and register are finished in nickel plate.

Farny Handstone.

F. A. Reichardt & Co., 391 Broadway, New York, makers of surgical instruments and fine metal goods, are manufacturing the Farny Handstone here shown. Fig. 1 illustrates the handstone about two-thirds actual size, Fig. 2 indicating one of the numerous ways of using



Farny Handstone.

it on the person for removing dead or callous epidermis. Attention is drawn by the manufacturers to the superiority of this cleansing agent over pumice and kindred articles. Being made of finely crushed and sifted carborundum, which is next to the diamond in hardness, and burned in a kiln at a temperature of 7500 degrees, which will volatilize iron, it is practically indestructible from wear. Scraped off skin, dirt and infectious matter can be destroyed by plunging into hot water or fire without the slightest injury to the stone. The material is molded in a die with lines and grooves, which are calculated to fit all the curves of hands and feet. The surface is composed of millions of fine cutting crystals. which with a pleasant touch to the skin at once removes all callous skin of hands or feet, dirty and grimed surfaces, spots and stains. While useful to any one, it is especially commended to workers in metals, chemicals, dyes, inks, &c., such as machinists, electricians, cabinet makers, photographers, compositors, pressmen, dyers, painters, chemists, &c., who can expeditiously cleanse their hands without the use of brushes, corrosive alkalies or acids, by using only good soap and water. Used by ladies as a toilet article, it leaves the hands clean and soft.

Stowell Bringback Hay Carrier Attachment.

In order to obviate the labor, inconvenience and loss of time incident to hauling back by hand a hay carrier after it has deposited its load the Stowell Mfg. & Foun-

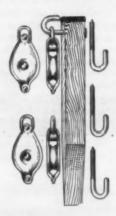


Fig. 1 .- Stowell Bringback Hay Carrier Attachment.

dry Company, South Milwaukee, Wis., is marketing a newly patented Bringback attachment, shown in Fig. 1 of the accompanying cuts. This consists of a series of hooks and pulleys so arranged with rope that the act of backing the horse or team pulls the carrier and fork



Fig. 2 .- Application of Attachment.

back from the mow to its place above the wagon. This was formerly done laboriously by hand. Incidentally the singletree, which formerly clattered against the horse's legs on the back-up trip, is held out of the way by this attachment.

Oilshere Combination Oiler and Oil Stone.

"Oilshere" is the name of a patented combination oiler and oil stone case which is being introduced by the Osborn Mfg. Company, Cleveland, Ohio. The invention consists of a sheet steel box, having in one end an oil reservoir which is so arranged that by pressing the thumb upon the spring brass top the oil is sprayed out



Fig. 1.—Oilshere Combination Oiler and Oil Stone.

upon the stone, which is contained in the box, or case, of which the oiler forms a part. The construction of this case protects the stone from damage and dirt, and saves frequent annoyance and delay occasioned by oilers being loaned, lost or otherwise separated from the stone. The box is provided with a slide cover, which will not drop off if a tool chest turns over. They are offered in an attractive gun metal finish, being made in two sizes, for stones $6 \times 2 \times 1$ and $8 \times 2 \times 1$ inches in dimensions.



Fig. 2 -Oiler in Use.

sions. By special arrangement with the Carborundum Company the Osborn Mfg. Company is able to offer Carborundum sharpening stones with their patented "Oilshere" cases at lowest factory prices. The box with 6 x 2 inch combination carborundum stone is especially recommended for use in manual training and industrial schools.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c
Lead, English white, in Oil. 24 94
Land Amoniona sphite in Oile
Lots of 500 lb or over @ 6% Lots less than 500 lb @ 7
In Barrels
Lots less than 900 10 \$\frac{1}{2}\$ In Barrels. \$\frac{1}{2}\$ \$\frac{1}{2}\$ to tin pails add to keep price. \$\frac{1}{2}\$ \$\frac{1}{2}\$ to tin pails, add to keep price. \$\frac{1}{2}\$ \$\frac{1}{2}\$ to tin pails, add to keep price. \$\frac{1}{2}\$ \$\frac{1}{2}\$ to tin safe to tins, add to keep price. \$\frac{1}{2}\$ \$\frac{1}{2}\$ to tin pails, and to keep the co \$\frac{1}{2}\$ \$\frac{1}{2}\$ to tin pails, and over 4de rebate; and 2d for the price of the constant of the price of the constant of the price of th
pails, add to keg price @ 1
Lead, White, in oil, 1 to 5 fb
Lead, American, Terms; For lots 12
tons and over 34 e rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs, and over
invoice; for lots of 500 lbs, and over
2% for cash if paid in 15 days from date of invoice, for lots of less than
500 lbs. net. 9 h Lead. White, Dry in bbls@ 6 Zinc, American, dry
Zinc, American, dry 4%@ 4%
Zine, French: Paris, Red Seal, dry81/2
Paris, Green Seal, dry
Antwerp, Green Seal, dry8% Zinc, V. M. French, in Poppy Oil:
Green Seal:
Lots of 1 ton and over11%@12% Lots of less than 1 ton12%@12% Zinc, V. M. French, in Poppy Oil:
Zinc, V. M. French, in Poppy Oil:
Red Seal: Lots of 1 ton and over10%@11%
Lots of less than 1 ton 1074/201184
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed
grades. 1%; 25 bbls., 2%; 50 bbls., 4%.
Dry Colors— W 10
Black, Carbon 5 @10 Black, Drop, Amer 4 @ 6 Black, Drop. Eng 5 @15 Black, Ivory 16 @20
Black, Drop. Eng 5 @15
Black, Ivory
Blue, Celestial. 4 @ 6 Blue, Chinese. 29 @32
Blue Prussian 27 @30
Blue, Ultramarine 44@15 Brown, Spanish
Carmine, No. 40
Green, Chrome, ordinary 316@ 6

	N 0.
1	Green, Chrome, pure
	Lead, Red, bbls. % bbls, and kegs:
	Lots 500 fb or over 6 61/2
6	Lots less than 500 b
	Litharge, American, bbls 6 @ 61/2
	Ocher, American W ton \$8.50@16.00
	Orcher, French
6	Orcher Foreign Golden 3 @ 4
	Orcher, French
	Orange Mineral, French101/2(@111/4
6	Orange Mineral, German 7%@10
62 00	Orange Mineral, French. 10½@11½ Orange Mineral, German. 7½@10 Orange Mineral, American. 8 @ 8½ Red, Indian, English. 4½@ 8½
9	Red, Indian, English 4%@ 8%
f	Red Turkey English 4 610
r	Red Tuscan English 7 @10
0.0	Red, Venetian, Amer. 39 100 th \$0,50(a).25
	Red Venetian, English 100 th \$1.15@1.75
	Sienna, Italian, Burnt and
6	Sienna Ital Bar Band 3 6 61
	Sienna American Raw 114/2 9
9	Sienna American Burnt and
4	Powdered 11/2@ 2
ě.	Red. Indian, English
	Talc, American
	Torra Alba English 30 100 th 00 (2) 00
6	
В	b., No. 1
	Terra Alba, American, # 100
6	ID., No. 2
6	Umber, Tkey, But. & Pow 256 356
8	Umber, Turkey, haw & Pow., 279(2 578
d	Umber, Turkey, Raw & Pow. 21/26 31/2 Umber, Burnt, Amer. 11/26 2 Umber, Raw, Amer. 11/26 2
	Yellow, Chrome
	Vermilion, American Lead10 @25
	Vermilion (mickelluce bulk 6005
	Vermilion, Quicksliver, bags (65)
	Vermilion, Quicksilver, bags
	Colors in Oil— # m Black, Lampblack
	Black, Lampblack
	Blue, Chinese
	Blue. Ultramarine
	Brown, Vandyke
10	Green, Chrome
	Green, Paris

Miscellaneous Barytes, White, Foreign	0@19.00 00@11.00 00@ 3.25 , @ .35 00@17.00 00@
Barytes Amer. floated 5 ton 13.0 Barytes Crude, No. 1. 5 ton 10.0 Chalk, in bulk. 5 ton 3.0 Chalk, in bulk. 5 ton 3.0 Chalk, in bbls. 100 5 China Clay, English. 5 ton 11.0 Whiting, Common. 100 b 2.0 Whiting, Common. 100 b 3.0 Whiting, Ex. Gilders. 100 b 3.0 Putty Commercial	0@19.00 00@11.00 00@ 3.25 , @ .35 00@17.00 00@
Barytes Amer. floated \$\pi\$ ton 17.0 Barytes Crude, No. 1. \$\pi\$ ton 10.0 Chalk, in bulk	0@19.00 00@11.00 00@ 3.25 , @ .35 00@17.00 00@
Cobait, Oxide	500 .48
Putty Commercial	
In bladders	05@1.10 00@2.90 40@1.55
Spirits Turpentine— In Oil bbls	P gal. 14@61 @61%
Glue-	w m
Cabinet	@15 @ 9 @34 @14
Foot Stock, Brown	@18
Irish	@16
	39 Th
Gum Shellac— Bleached Commercial32 Bone Dried42	(643
Gum Shellac	@33 @43 @45 @52
Gum Shellac	@33 @43 @45 @52 @45 @35
Gum Sheilac	@33 @43 @45 @52 @65 @35 10@1.20 @50

Animal, Fish and Vege-
table Oils- W gal
Linseed, City, raw
Mineral Oils-
Black, 29 gravity, 5630 cold # gal. test

irrent

General Goods .- In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33¹/_a @ 33¹/_a & 10% signifies

that the price of the goods in question ranges from 331/a per cent. discount to 331/4 and 10 per cent. discount.

Names of Manufacturers .- For the names and addresses of manufacturers see the advertising columns and also The Iron Age Directory, issued May, 1904, which gives a classified list of the products of our advertisers and serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

More		
Anvils American— Eagle Anvils Brogatile Horsenboe brand, Wrought 1994 Horsenboe brand 1994 Horsenboe 1994 Horsenboe brand 1994 Horsenboe 1		Concord, Loose Collar 44/4/4/4 Concord, Solid Collar 44/4/3/4/6 No. 1 Common, Loose 34/4/3/4/6 No. 14 Common, Loose 34/4/3/4/6
Anvils American— Eagle Anvils Brogatile Horsenboe brand, Wrought 1994 Horsenboe brand 1994 Horsenboe 1994 Horsenboe brand 1994 Horsenboe 1	Ives' Patent35% Taplin's Perfection35%	No. 2 Solid Collar
Eagle Anvils. Wrought. \$98748 Horseshoe brand, Wrought. \$98948 Frenton	tridges, Shells, &c.	Nos. 19 to 2275&10@75&10&5% Boxes, Axle-
Peter Wright & Sous. \$ 10 10/46 Anvil, Vise and Drill- Millers Falls Co. \$18.00\$4.10/4 Apple, do\$4.00/4 Apple, do	Anvils-American-	Common and Concord, not turned
Peter Wright & Sous. \$ 10 10/46 Anvil, Vise and Drill- Millers Falls Co. \$18.00\$4.10/4 Apple, do\$4.00/4 Apple, do	Hay-Budden, Wrought	Common and Concord, turned. 10., 51/266 Half Patent
Anyli, vise and Diss. Apple Areas. See Parers, Apple, dc. Aprons, Blacksmiths'— Livingaton Nail Co. 318.0. 334.7 Augers and Bits— Com. Double Spaw. 704.09 Borring Mach Augers. 704.09 Car Bits, 12-in, twoist. 504.00 Cord Suger and Car Bits. 505. C. E. Jennings and St. 505.00 C. E. Jennings & Co. mings list. 505. C. E. Jennings list. 505. C. E. Jennings & Co. mings list. 505. C. E. Jennings list. 505. C. E. Jennings & Co. mings list. 505. C. E. Jennings list. 5	Imported-	
### Aprons, Blacksmiths	Anvil. Vise and Drill-	Hendryx: A Bait
Car Bits Car	Apple Parers - See Parers,	
Augers and Bits— Com. Double Spur 704.07 Shoring Mach, Augers 704.07 Car Hits, 12-in, isoist 504.07 Cord's Auger and Car Bits 404.55 Cert auger and Car Bits 404.55 Cert land auger is 404.55 Cert land auger	Aprons, Blacksmiths'-	Caldwell new list
Barb Wire—See Wire, Barb. Seria Auger and Car Hits. 408278 No. 10 ext. lip. R. Jennings' list. 408278 No. 10 ext. lip. R. Jennings' list. 408278 No. 10 ext. lip. R. Jennings' list. 408278 Hommedieu Car Bits. 528 108272 Hommedieu Car Bits. 608278 Hillers Falls. 608278 Hillers Hangers Bits. 608278 Hillers Falls. 608278 Hillers F		Spring-
No. 10 ext, lip. R. Jennings list. 28 No. 30 R. Jennings 26 10 26 33 46 34 46 46 46 46 4	Com. Double Spur704.10% Boring Mach. Augers704.10% Car Bits, 12-in. twist504.10% Jennings' Patn. reg. finish.504.10% Ford's Auger and Car Bits40855	
Chattillon's No. 2	No. 10 ext. lip. R. Jenninga' list. 25% No. 30, R. Jenninga' list 40&7½% Russell Jenninga'	Steel Crowbars, 10 to 40 lb per lb., \$%@31/4¢
Chattillon's No. 2	Mayhew's Countersink Bits	No. 10 Ideal, Nickel Plate. W gro. \$8.50
See Drills Twist	Car Bits	Resters Carpet-
Cimiet Bits— Per gro. Common Dbie. Cut \$3.00@3.55 German Pattern, Nos. 1 to 10. \$1,60; Ilto 13, \$5.75 Hollow Augers— Bonney Pat., per dos.\$9.00@19.00 Inversal	Snell's Car Bits, 12-in, twist60&10% Wright's Jennings' Bits50%	Holt-Lyon Co.: No. 12 Wire Coppered & doz. \$0.85;
Cimiet Bits— Per gro. Common Dbie. Cut \$3.00@3.55 German Pattern, Nos. 1 to 10. \$1,60; Ilto 13, \$5.75 Hollow Augers— Bonney Pat., per dos.\$9.00@19.00 Inversal	See Drills, Twist.	No. 11 Wire Coppered © doz. \$1.10; Tinned
Common Dble. Cut\$3.00@3.25 German Pattern, Nos. 1 to 10, \$\$,60; 11to 13, 35.75 Hollow Augers— Bonney Pat., per dos.\$9.00@10.00 Ames	Clark's small, \$18; large, \$2650&10% Clark's Pattern, No. 1, \$2 doz. \$26; No. 2, \$1850&10@60% Ford's, Clark's Pattern50&10@60% O. E. Jennings & Co., Steer's Pat2%	Western W. G. Co.: No. 1 Electric
## ## ## ## ## ## ## ## ## ## ## ## ##	Common Dble, Cut\$3.00@\$.\$5	Holt-Lyon Co.; Holt, No. A. Japanned @ doz. \$1.20 Holt, No. I. Tinned @ doz. \$1.50 Holt, No. B. Japanned @ doz. \$2.00 Holt, No. 2. Tinned @ doz. \$2.25
## ## ## ## ## ## ## ## ## ## ## ## ##	\$4.60; 11 to 13, \$5.75 Hollow Augers—	Lyon, No. 3, Japanned. 4 doz. \$1.50 Taplin Mfg. Co.: No. 60 Improved Dover. \$6.00 No. 75 Improved Dover. \$6.00
## ## ## ## ## ## ## ## ## ## ## ## ##		No. 100 Improved Dover
## ## ## ## ## ## ## ## ## ## ## ## ##	Cord's	No. 300 Imp'd Dover Mammoth, & doz. \$25.00 Western, W. G. Co., Buffalo \$7.00 Wonder (S. S. & Co.) & gro. net, \$6.00
Blacksmiths		Blacksmith, Standard List
Unhandled, Patent. gro.66@70¢ leg Auch: Unhandled, Patent. gro. 31@34¢ Unhaled, Shidered. gro. 65@70¢ Scratch Ausls: Handled, Com gro. \$3.50@4.00 Handled, Booket. gro. 31.50@4.00 Hurwod Murwod Murwod Makes— Single Bit, base weights. (up to 34 hb.) First Quality OTE.—Heavier Weights add Extras as per regular schedule. Axle Grease— See Grease, Asle Extra Length: Each. \$3.75 \ 1.25 \ 4.75 \ 5.25 \ 6.00 \ 7.00 Handled, Sooket. gro. \$1@34¢ Hand— Hoz. \ \$4.50 \ 5.00 \ 5.50 \ 6.00 \ 6.50 Molders— Inch. \ 9 \ 10 \ 11 \ 12 \ 14 \ Doz. \ \$8.00 \ 10.50 \ 12.50 \ 14.50 Bells—Cow— Ordinary goods 75&5@75&10&5% High grade 70&10@70&10&5% High grade 70&10@70&10&5% Texas Star	Brad Awls:	Blacksmiths'— Inch 30 32 34 36 38 40 Each \$3.25 3.50 4.00 4.50 5.00 5.75
Handled, Socket.gro.\$11.50@12.00 Iurwood	Unhandled, Patentgro.66@70¢	Extra Length: Each.\$3.75 4.25 4.75 5.25 6.00 7.00 Hand—
Awi and Tool Sets—See Bets, Awi and Tool. Axes— Doz_\$8.00 9.00 10.50 12.50 14.50 Bells— Cow— Ordinary goods 75.65@75.610.65 % High grade 75.65@75.610.65 % First Quality \$6.00 First Quality \$6.00 Second Quality \$6.00 Moreover Weights add Extras as per regular schedule. Axie Grease— See Grease, Asie See Grease, Asi	Handled, Comgro. \$3.50@4.00 Handled, Socketgro.\$11.50@12.00	Molders-
Ordinary goods . 73&507361065	Awi and Tool Sets—See	Doz.\$8.00 9.00 10.50 12.50 14.50 J
Texas Star	Axes—	Ordinary goods75&5@75&10&5% High grade70&10@70&10&5% Jersey
Sec Green, Asser Tamee Gong	Control & Control & Control & Control	Door-
Sec Green, Asser Tamee Gong		Burton Gong
		Yankee Gong

Hand- Hand Bells, Polished, Brass	Plow65&10@65&10&10
ROLL GROATUREY	Stove 82 /2d 10@ 82 /2d 10d 5)
White Metal	Tire— Common
Sicias	American Screw Company:
Silver Chime	Norway Phila., list Oct. 16, '8480' Eagle Phila., list Oct. 16, '8482'
Farm Bellslb. 244	Bay State, list Dec. 28, '9980', Franklin Moore Co.:
50&10&5@60&5%	Norway Phila., list Oct. 16, '8480' Eagle Phila., list Oct. 16, '8482's
American Tube & Stamping Co. Gongs 75% Table Call Bells 50059&10%	Eclipse, list Dec. 28, '9980; Russell, Burdsall & Ward Bolt &
	Russell Burdsall & Ward Bolt & Nut Co. : Empire list Dec. 28, '99
	Norway Phila., list Oct., '8480', Upson Nut Co.:
Regular Short Lap. 0620065; Regular Short Lap. 65610(270); Standard	Tire Bolts
Light Standard 70&10@75% Out Leather Lacing 80&10%	Borers, Tap- Borers Tap, Ring, with Handle:
Leather Lacing Sides, per sq. ft.	Per doz \$4.80 5.60 6.40 8.0
Pubbor-	Inch 1¼ 1½ 1½ 1½ 2 Per doz \$4 80 5.60 6.40 8.0 Inch 2½ 2 Per doz \$6.65 11.5 Enterprise Mig. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each 25
Agricultural (Low Grade)55 / 75@75&5 / 75&75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&5 / 75&75&75&5 / 75&75&75&75&75&75&75&75&75&75&75&75&75&7	Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each 25;
Common Standard 70@70&10% Standard 65&70%	
Extra	C. E. Jennings & Co
High Grade50&5@50&10% Bench Stops—	Perfection
See Stops, Bench	Dokes, Mitre
Benders and Upsetters,	Braces—
Detroit Perfected Tire Bender 40%	Common Dall Amenton acards
Betters	Fray's Genuine Spofford's60
setters	Common Batt American 31.23(1.3 Barber's 5.04c1084010.600.10 Fray's Genuine Spofford's 6.0 Fray's No. 70 to 120, 81 to 122, 207 to 418 C. E. Jennings & Co. 50&5 Mayhew's Ratchet 60 Mayhew's Ratchet 60 Mayhew's Ratchet 25&10 Millers Falls Drill Braces 25&10 P. S. & W. Co., Peck's Pat.60&1065 Stanley R. & L. Co.; 35%
\$20.59. Bicycle Goods—	Mayhew's Ratchet 60 60 60 60 60 60 60 60 60 60 60 60 60
John S. Leng's Son's 1902 list:	Millers Falls Drill Braces25&10
Chain .50% Parts .50% Spokes .50% Tubes .60%	Stanley R. & L. Co.:
	Victor45%
Auger, Gimlet, Bit Stock Drills,	Wrought Steel 80&10@80&10&5%
&c.—See Augers and Bits. Blocks— Tackle—	Full cases
Common Wooden 70&10@75&5%	Broken cases
Hartz St. Tackle Blocks50a50&5% Hollow Steel Blocks. with Ford's	Griffin's Folding Brackets70&10 Stowell's Cast Shelf
Patent Sheaves	Stowell's Sink
Stowell's Novelty, Mal. Iron50&10%	Bright Wire Goods-
Common Wooden 70&10@75&5 % Hartz St. Tackle Blocks 50&650&5 % Hollow Steel Blocks, with Ford's Patent Sheaves 50&10 % Lane's Patent Automatic Lock and Junior Stowell's Novelty Mal. Iron 50&10 % Stowell's Self Loading 60 % See also Machines, Hoisting,	See Wire and Wire Goods. Broilers—
Boards, Stove— Zinc, Crystal, dc30419@40410%	Kilbourne Mfg. Co
Boards, Wash-	Wire Goods Co
See Washboards. Bobs, Plumb—	Price ner down
Keuffel & Esser Co	Quart 10 12 14 Water, Regular 1.40 1.70 1.90 Water, Heavy 3.40 3.70 3.80 Fire, Rd. Bottom 2.30 2.55 2.93 Well 2.55 2.87 3.15
Bolts— Carriage, Machine, &c.—	Water, Heavy3.40 3.70 3.80 Fire, Rd. Bottom2.30 2.55 2.95
Common Carriage (cut thread) .	Well
% x 6 and Smaller	Bucks, Saw- Hoosier
80%	Bull Rings—See Rings, Bull Butts— Brass—
Bolt Ends, list Feb. 14, '9570&21/2%' Machine, % x 4 and smaller	Wrought, Ust Sept., '96 30%
Machine, larger and longer	Wrought, list Sept., '9630% Cast Brass, Tiebout's50% Cast Iron—
Door and Shutter	Fast Joint, Broad. 40&10@50% Fast Joint, Narrow. 40&10@50% Loose Joint. 70&10@75% Loose Ph. 70&10@75% Mayer's Hinges 70@70&5 Parliament Butts 70@70&5
Cast Iron Barrel, Japanned,	Loose Pin 704 100 75%
Round Brass Knob: Inch, 3 4 5 6 8 Per doz. \$0.30 .35 .45 .56 .75	Mayer's Hinges
Cast Iron Spring Foot, Jap'd:	Wrought Steel-
Inch 6 8 10 Per doz\$1.15 1.40 2.00	Narrow and Broad
Cast Iton Chain Flat Januaned: 1	Table and Back Flaps 75% Narrow and Broad 75% Inside Blind
Per doz\$0.95 1.25 1.55	Loose Pin, Jap'd70&10%
Cast Iron Shutter, Japanned, Brass Knobs:	Loose Pin. 75%, Loose Pin, Jap'd. 706.10% 50 Coope Pin, Ball and Steeple Tin. 85% Japanned Ball Tip Butts. 796.10% Bronzed, Wrt., Nar. and In.
Inch	Japanned Ball Tip Butts 70.610%
Wrt Barrel Japd 80@80&10%	Bronzed, Wrt., Nar. and Inside Blind Butts55&10%
Wrt. Spring70&10@179&10&10%	Canas Bird
Wrt. Shutter 5045@5041045 Wrt. Square Neck 75@75419%	Wages, Bird — Hendryx Brass: 3000, 5000, 1100 series
Wrt Square. 66 % & 10@68 % & 10&10 % Ives' Patent Door	3000, 5000, 1190 series
1 1 /6	200, 500 and 500 series\$0&10%

	Stove and Plow-
2	Plow
200	Tire—
2	Common
	Norway Iron80%
0/0	Norway Phila., list Oct, 16, '8480%
	Eagle Phila., list Oct, 16, '84821/2'
•	Franklin Moore Co.:
	Norway Phila., list Oct. 16, '8480%
,	Eclipse, list Dec. 28, '9980%
9	Russell, Burdsall & Ward Bolt &
	Common Norway Iron
	Upson Nut Co.:
	Tire Bolts
	Borers, Tap-
	Borers Tap, Ring, with Handle:
	Inch 1\(1\\ 1\\ 2 \) Per doz\$\\$4.80 5.60 6.40 8.00
1	Inch
	Per doz\$6.65 11.50
	2, \$1.65; No. 3, \$2.50 each25%
	Boyce Mitro
	C. E. Jennings & Co
Ч	Perfection
. 1	Schatz 40% 40% 40% 8tanley R. & L. Co.: Nos. 240 to 460. 30% Nos. 50 and 60. 35%
4	Nos. 240 to 46030%
1	Nos. 50 and 60
ı	Common Ball, American. \$1.25@1.30
1	Common Hall American 31.25(21.30 Barber's 50&10&10.026
1	Fray's Genuiue Spofford's60%
1	414
1	C. E. Jennings & Co50&5%
ı	Mayhew's Quick Action Hay Pat50%
1	P. S. & W. Co. Peck's Pat 60& 10ta 65
ı	Stanley R. & L. Co.:
1	Victor
i	Brackets-
i	
1	Bradley's Wire Shelf:
I	Wrought Steet. Socio@80&10&5% Bradley's Wire Shelf: Full cases. Socio@10% 10% 10% 10% 10% 10% 10% 10% 10% 10%
ı	Griffin's Pressed Steel80@80&10%
1	Stowell's Cast Shelf
1	Western, W. G. Co., Wire60&10%
ı	Bright Wire Goods-
1	Didut Asile Goods-
	See Wire and Wire Goods
ı	See Wire and Wire Goods
ı	See Wire and Wire Goods
	See Wire and Wire Goods
	See Wire and Wire Goods. Broilers— Kilbourne Mig. Co
	See Wire and Wire Goods. Broilers— Kilbourne Mfg. Co
	See Wire and Wire Goods. Broilers— Kilbourne Mfg. Co
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	See Wire and Wire Goods
	See Wire and Wire Goods. Broilers— Kilbourne Mig. Co

Hendryx Bronze: 40&10% Hendryx Enameled. 40&10%	Chisels—	Coolers, Water-	Tobacco-
Calipers—See Compasses.	SocketFraming and Firmer Standard List75@75&10%	Gal. each 2 3 4 6 8 Labrador\$1.20 \$1.50 \$1.80 \$2.10 \$2.70	All Iron, Cheap doz. \$4.25@\$4.50 Enterprise
Calks, Toe and neel-	Charles Buck30%	Gal 3	\$18
Sharp, 1 prongper lb. 144 & Sharp, 1 prongper lb., 142014	C. E. Jennings & Co. Socket Firmer	Galv, Lined, ea.\$1.85 \$2.00 \$2.25 \$2.90 \$3.90	
Gautier, Blunt	No. 10	Gavl. Lined, side handles, Gal. 2 3 4 6 8	Washer- Appleton's, \$1 doz., \$16.0050&10&10%
Gautier Blunt 4@4% Gautier Sharp 4% 4% 4% 4% 4% 4% 4% 4	Swan's	Gal. 2 3 4 6 8 Each. \$1.95 \$2.15 \$2.40 \$3.30 \$4.1525%	
Can Openers-	Tanged—	Coopers' Tools— See Tools, Coopers'.	Dalbey Post Hole Auger. per doz., \$9.00
See Openers, Can. Cans, Milk—	Tanged Firmers . 33 1-36033 1-3610%	Cord— Sash-	Iwan's Imp'ved Post Hole Auger 40&5%
State	Buck Bros	Braided, Drab	Augers
New York Pattern. 1.50 2.20 2.45 each. Baltimore Pattern. 1.50 2.29 2.45 each.		Cable Laid Italian	Iwan's Split Handle Post Hole Dig-
	Cold Chisels, good quality . 13@15¢	lb., A. 18¢ : B. 16¢	Kohler's Universal doz. \$7.25
Buffalo Family Oil Cans;	Cold Chisels, fair quality.11@12¢ Cold Chisels, ordinary 9@10¢	Common Indialb. 10@10½¢ Cotton Sash Cord, Tw'tedl1@17¢ Patent Russialb@14¢	Kohler's Hercules doz. \$12.00
\$18.00 60.00 129.60 gro., net.	Chucks-	Cable Laid Russialb@15¢ India Hemp, Braidedlb@18¢	Kohler's Rival
Caps, Percussion— Eley's E. B	Beach Pat., each \$8.0035&5% Pratt's Positive Drive25%	India Hemp, Twisted lb. 12@13¢	Wan 8 Split Handle Post Hole Dis- gers 0 ct 57 ct Kohler's Universal 0 ct 51 ct Kohler's Little Giant 0 ct 52 ct Kohler's Hercules 0 ct 52 ct Kohler's Hercules 0 ct 52 ct Kohler's Invincible 0 ct 52 ct Kohler's Rival 0 ct 52 ct Kohler's Rival 0 ct 52 ct Kohler's Pioneer 0 ct 52 ct Kohler's Pioneer 0 ct 52 ct Kohler's All (0 ct 52 ct Kohler's Rival 0 ct 0 ct 0 ct Kohler's Rival
G. D		Patent India, Twisted, lb. 126/13¢ Anniston Cordage Co.: Braided Cotton. Old Glory, Nos. 7 to 12	Samson, # doz. \$34.00
G. E	Blacksmiths	Anniston, Nos. 7 to 12	Dividers—See Compasses.
Primers-		Anniston Drab, Nos. 7 to 12. 9 lb 28 e	Phillips', style E, % in \$\pi\$ doz. \$10.00
Berdan Primers, \$2 per M20% B. L. Caps (Sturtevant Shells)	Combination 50% Drill Chucks, New Model 30% Drill Chucks, Standard 45% Drill Chuck, Skinner Pat. 0, 1, 2.35%	22½¢; No. 7, 21½¢; Nos. 8 to 12, 21¢	Phillips', style E. % in # doz. \$10.00 I'hillips', style 077, % in # doz. \$7.50 Phillips', style x-y, % in # doz. \$10.50
\$2 per M	Drill Chucks, Skinner Pat., 3, 4, 5, 6, 7, 8	Eddystone Braided Cotton, No. 6.	Drawers, Money-
Cartridges-	Drill Chucks, Positive Drive30% Planer Chucks	Harmony Cable Laid Italian, Nos. 7 to 10	Tucker's Pat, Alarm Till No. 1, 39 doz., \$18; No. 2, \$15; No. 3, \$12; No. 4, \$18.
Blank Cartridges: 32 C. F. \$5.50	Face Plate Jaws	to 10	
38 C. F., \$7.00	Standard Tool Co.: Improved Drill Chuck45% Union Mfg. Co.:	Cable Laid Italian	See Knives, Drawing.
Blank Cartridges; 32 C. F., \$5.50		Cable Laid India	
	Combination 30% Combination 30% Combination Geared Scroll 40% Geared Scroll 40% Independent 50% Independent 50% Union Prill 45% University 55% Combination 55% Combina	Braided, Drab Cotton	Diamond Emery Wheel Dressers35% Diamond Wheel Dresser Cutters35%
Central Fire	Independent Steel	Braided, Linen	Drills and Drill Stocks-
Primed Shells and Buttets. 10c 10%	Universal 50%	Massachusetts, White, White	Common Blacksmiths' Drill, each\$1,50@\$1.75
Rim Fire, Sporting50% Rim Fire, Military15&5%	Independent Steel F. Plate Jaws. 40%	Massachusetts, Drab 16 15 32 e Phoenix, White, Nos. 8 to 12, 24 e:	Breast, Millers Falls
Casters— Bed	Universal 55% Universal 55% Independent Iron F, Plate Jaws. 40% Independent Steel F, Plate Jaws. 40% Westcott Patent Chucks: Lathe Chucks. 50% Little Giant Auxiliary Drill. 50% Little Giant Double Grip Drill. 50% Little Giant Drill, Improved. 50% Oneida Drill. 50%	Massachusetts, White # 10 35 ¢ Massachusetts, Drab # 10 32 ¢ Phoenix, White, Nos. \$ to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢. Silver Lake:	Goodell Automatic Drills. 40&5@40&10% Johnson's Automatic Drills, Nos. 2
Philadelphia	Little Giant Double Grip Drill50% Little Giant Drill. Improved50%	Shirer Lake: A quality, Drab.	Johnson's Drill Points
Acme, Ball Bearing	Oneida Drill	B quality, White	Ratchet, Curtis & Curtis
Boss 104.10/5 Boss Anti-Friction 70&10/5 Gem (Roller Bearing) 80/5 Martin's Patent (Phoenix) 45/5 Standard Ball Bearing 45/5 Tucker's Patent low list 30/5 Yale (Double Wheel) low list 50/2	Clamps—	Linen	Common Blacksmiths' Drill, each \$1.50@\$1.75 Breast, Millers Falls 5&10 Breast, Millers Falls 5&10 Breast, P. S. W 0.065% Goodell Automatic Drills, 40&56440&10 Johnson's Automatic Drills, Nos. 2 and 3. 164% Johnson's Drill Points 1.64% Millers Falls Automatic Drills, 334&10 Ratchet, Curtis & Curtis 34 Ratchet, Parker's 40 Ratchet, Weston's 5. 334% Ratchet, Whitney's P. S. & W.502 Whitney's Hand Drill, No. 1, \$10.00; Adjustable, No. 10, \$12.00 534%
Martin's Patent (Phoenix)45% Standard Ball Bearing45%	Adjustable, Hammers'20@20&5% Cabinet, Sargent's50&10%	Wire, Picture-	Whitney's Hand Drill, No. 1, \$10.00;
Tucker's Patent low list	Carriage Makers', P. S. & W. Co50% Carriage Makers', Sargent's60%	85&10&10@85&10&10&5% Hendryx Standard Wire Picture Cord, 85&10&5%	I WISC DITTIE
Cattle Leaders-	Cabinet. Sargent's		Bit Stock60&10&10@70% Taper and Straight Shank
See Leaders, Cattle. Chain, Coil—	Saw Clamps, see Vises, Saw Filers'.	Gradies— Grain	60&10@60&10&5%
	Cleaners, Drain— Iwan's Champion, Adjustable55%	Crayons—	Drivers, Screw— Screw D'ver Bits, per doz. 45@60¢
3-16 14 5-16 18 7-16 14 9-16 7.40 5-10 14.15 3.45 3.30 3.20 3.15 3.45 3.45 3.50 3.20 3.15	Iwan's Champion, Adjustable55% Iwan's Champion, Stationary45% Sidewalk—	White Round Crayons, gr. 51/2@6¢	Balsey's Screw Holder and Driver, \$\text{9}\$ doz., \$2\forall -1.00 feb. \$\text{10}\$. \$\text{4-in.}\$, \$\text{47.50}\$; \$\text{6-in.}\$ \$\text{9}\$. \$\text{40}\$. Buck Bros.' Screw Driver Bits \$\text{30}\$ \$\text{7}\$.
		Cases, 100 gro., \$4.00, at factory. D. M. Steward Mig. Co.:	Buck Bros.' Screw Driver Bits30 Champion
German Coil60&10&10@70% Halters and Tles—	Star Socket, All Steel. # doz. \$4.05 net Star Shank, All Steel. # doz. \$3.24 net W. & C. Shank, All Steel, # doz., 7½ in., \$3.00; 8 in., \$3.25.	Jumbo Crayons	
Halter Chains60&10@60&10&10%	Cleavers, Butchers'-	or square	Fray's Hol. H'dle Sets, No. 3, \$12.50 Gay's Double Action Ratchet
list July 24, '9760d.10d.10% Cow Ties60@60d.10%	Foster Bros. 30%	Railroad Crayons (composition)	Hurwood Mayhew's Black Handle
Trace, Wagon, &c	New Haven Edge Tool Co.'s45% Fayette R. Plumb334@334&10% L. & I. J. White30%	Zelnicker's Lumber; Red, Blue, Green	Mayhew's Monarch 40&10 Millers Falls, Nos. 20 and 21 25&10
Traces, Western Standard: 100 pr.	Clippers—	See also Chalk.	Goodell's Auto. 50&10&10&50&10&50&10&50&10&50&10&50&10&50&10&50&10&10&50&10&10&50&10&10&10&10&10&10&10&10&10&10&10&10&10
6½-6-3, Str'ght, with ring \$25.50 6½-6-2, Str'ght, with ring \$24.50 6½-8-2, Str'ght, with ring \$28.00 6½-10-2, Str'ght, with ring \$28.00	Chicago Flexible Shaft Company:	Crooks, Shepherds'-	Sargent & Co.'s:
61/2-10-2, Str3ght, with ring.\$32.00	98 Chicago Horse	Fort Madison, Heavy doz. \$7.00 Fort Madison, Light doz. \$6.50	Nos. 50 and 55
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than	Chicago Belt\$20,00 \ 15% Stewart's Patent Sheep, \$12.7520%	Crow Bars-See Bars, Crow.	Smith & Hemenway Co40&5% H. D. Smith & Co.'s Perfect H'dle.40%
Straight Link. Trace, Wagon and Fancy	Finger Nail Clippers-	Cultivators-	Stanley R. & L. Co.'s: No. 64, Varn. Handles
Chains60&5@60&10&5% Miscellaneous—	Smith & Hemenway Co. # doz. net \$2.00	Victor Garden50%	No. 86
Jack Chain, list July 10, '93:	Eagle, 5-16 and % in 75@75&10% Norway, 5-16 and % in . 60&10@70%	International Silver Company:	Denance
Brass		Star, Eagle, Rogers & Hamilton	Nos. 65 to 68
Safety Chain 75@75&10&5% Gal. Pump Chain lb. 5@54% Covert Mfg. Co.:	Cloth and Netting, Wire —See Wire, &c.	International Silver Company: No. 12 M'd'm Knives, 1847. # doz. \$3.50 Star, Eagle, Rogers & Hamilton and Anchor # doz. \$3.00 Wm. Rogers & Son # doz. \$2.50	
Breast	Cocks, Brass-	Cutters— Glass—	Lave Trough, Galvanized— Territory. L. C. L.
Heel40&2%	Hardware list: Compression, Plain Bibbs,	H. H. Mayhew Co	A, Eastern
Covert Sad. Works:	Globe, Kerosene, Racking, &c., Cocks70&10@75%	woodward40%	Central
Halter70%	Coffee Mills-	Meat and Food—	8. Western 754 12149
Hold Back	See Mills, Coffee. Collars, Dog-	Nos	Terms.—2% for cash. Factory ship- ments generally delivered. See also Conductor Pipe and Elbows.
Am. Coll and Halters40@40&5%	Nickel Chain, Walter B. Stevens & Son's list	Nos 5 10 12 22 32	Elbows and Shoes—
Eureka Coil and Halter45@50&5% Niagara Coil and Halter45@50&5%	Leather, Walter B. Stevens & Son's list	Dixon's	Factory shipments: Plain Rd., and Rd., Cor., 2, 3
Oneida Community: Am, Coil and Halters	Combs, Curry-	Ideal \$14.00 \$17.00 \$19.00 \$30.00	and 1 in
Wire Goods Co.: Dog Chain	Metal Stamping Co40% Mane and Tail—	Little Giant	and 6 in
Chalk - (From Jobbers.)	Covert's Saddlery Works60&10%	Meat and Food—	Emery, Turkish—
Carpenters' Bluegro. 35@38¢ Carpenters' Redgro. 30@33¢ Carpenters' Whitegro. 25@28¢	Compasses, Dividers, &c.	New Triumph No. 605, \$7 dos. \$24.00	Stole 51 to 180 Flour
Carpenters' White gro. 25@284	Ordinary Goods	355.00 348.00 342.00 382.00 388.00 N. E. Food Choppers	Kegs
See also Crayens. Checks, Door-	Dividers 65% Calipers, Double 65% Calipers, Inside or Outside 65% Calipers, Wing 65%	\$15.00 \$18.00	10-10. cans.
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Calipers, Wing	Enterprise Beef Shavers25@30%	10 in case 61/2¢ 7 ¢ 6 ¢ 10-1b. cans, less
Chests, Tool—	Conductor Pipe, Galva	Slaw and Kraut— Henry Disston & Sons:	than 1010 ¢ 10 ¢ 8 ¢ Less quantity10 ¢ 10 ¢ 8 ¢
A	L. C. L. to Dealers: Territory. Nested. Not nested.	Henry Disston & Sons: Slaw, Corn Grater, &c40% Kraut Cutters, 2i x 7, 25 x 8, 30	NOTE.—In lots 1 to 3 tons a discount of 10% is given.
Youths' Chests, with Tools40% Gentlemen's Chests with Tools	A Eastern75&5% 75% B, Eastern75&10% 75&5%	Kraut Cutters 36 v 12 46 v 12 46	Extractors, Lemon Juice
Farmers', Carpenters', etc., Chests, with Tools	Central75&5% 70&10&5% Southern70&74% 70&24%	Slaw Cutters, 1 Knife & doz. \$3.00	—See Squeezers, Lemon.
American Tool Chest Oo.: Boy's Chests, with Tools	8. Western 7045% 70% Terms, 60 days; 21 cash 10 days. Fac-	Grater Dorsey Mfg. Co.: \$\psi\$ dos. \$4.00 Tucker & Dorsey Mfg. Co.: 40% Kraut Outters. 1 Knife. \$\psi\$ gr. \$1566326 Slaw Cutters, 2 Knife. \$\psi\$ gr. \$226336	Zimmerman's
Tool Cabinets	tory shipments generally delivered. See also Eave Troughs.	Slaw Cutters. 1 Knife. W gr. \$18@\$20	Cord and Weight-
2 10 /g	Troughs,	Slaw Cutters, 7 Knife. W gr. \$22@\$36	Ives40%

April 6, 1905	THE IRO	ON AGE	1217
Faucets	Glass, American Window See Trade Report. Glasses, Level— Chapin-Stephens Co	Barn Door, New England Pattern, Check Back, Regular: Inch	Hangers— Garment— Pullman Trouser, No. 1
Net Prices: Inch. 15 17 19 21 24 Per doz \$2.15 2.85 3.25 3.75 4.50 P. S. & W. Co	Sisal Rope Halters	New York	3 & 5. 3. 3. 3. 3. 3. 3. 3.
Red, Dbl. Brace, per doz.\$1.40@1.50 Freezers, Ice Cream— Qt	Mechanics' Tool Handles— Auger, assorted gro. \$2.50632.85 Brad Aul. gro. \$1.55631.85 Chisel Handles: Apple Tanged Firmer, gro. assorted \$3.40632.65 Hickory Tanged Firmer, gro. assorted \$3.15632.40 Apple Socket Firmer gro. assorted \$1.5632.95 Hickory Socket Firmer, gro. assorted \$1.5631.95 Hickory Socket Firmer, gro. assorted \$1.5631.95 Hickory Socket Framing, gro. assorted \$1.45631.95 Hickory Socket Framing, gro. assorted \$1.50631.75 File, assorted \$1.60631.75 File, assorted \$1.60631.75 File, assorted \$6.6106606.610.610% Hand Sav, Varnished doz. 80.685¢; Not Varnished doz. 80.685¢; Not Varnished .65675¢ Plane Handles: Jack, doz. 30¢; Jack, Bolted.75¢ Fore, doz. 45¢; Fore, Bolted.99¢ Chapin-Stenhens Co: Carring Tool. 50696.10 Simple Tells Adl. 6668.610 Stew Driver 606906.10 Nicholson Simplicity File Handle. 156.10 Nicholson Simplicity File Handle. 156.10 NoTE - Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers are double set with track, and Parlor Door Hangers are double set with track, ec. Barn Door, New Pattern, Round Groove, Regular: Inch \$1.500.	Railrond Rex Hinge Door	Spring Hinges— Holdback Cast Iron. 3ro. \$3.00@\$3.50 Non-Holdback, Cast Iron. J. Bardsley: Bardsley: Spring Hinges. 57 Bardsley: Spring Hinges. 57 Bardsley: Spring Hinges. 58 Bommer Bala Bearing Floor Hinges. 59 Bommer Spring Hinges. 50 Chicago (Ball Bearing) Floor Hinges 50 Chicago (Ball Bearing) Floor Garden City Engine House. 50 Chicago (Ball Bearing) Floor Garden City Engine House. 50 Chicago (Ball Bearing) Floor Garden City Engine House. 50 Chicago (Ball Bearing) Floor Garden City Engine House. 50 Columbia No. 18. 60 Columbia, No. 18. 60 Columbi

Wrought Iron Hinges-	
Strap and T Hinges, &c., list	Horse N
	See Nails
H'vy Strap H'g's7565%	See Shoe
Heavy T Hinges60%	Hose, R
Extra H'y T H'g's.70&10% 25 Hinge Hasps50%	Competitie 3-ply Stan
December 20, 1904: Light Strap Hinges75% H'vy Strap H'g's75&5% Light T Hinges65% Heavy T Hinges60% Extra H'y T H'g's.70&10% Hinge Hasps50% Cor. Heavy Strap75&5% Cor. Ex. Heavy T.70&10% Screw Hook [6 to 12 inlb. 3½6 and Strap. [1] to 20 inlb. 3¼6 Screw Hook and Eye:	4-ply Stan 3-ply extr
Screw Hook 6 to 12 in lb . 3½¢ and Strap. { 14 to 20 in lb . 3¼¢	1-ply extr
Screw Hook and Eye:	Low Grad Fair Qual
3/4 to 1 inch	
	From A to 1
Hitchers, Stall Covert Mfg. Co., Stall Hitchers35%	From 4 to 1 B. B. Sad I
Hods- Coal-	Chinese La Chinese Sa Mrs. Potts',
Inch 15 16 17 18	Nos Jap'd Top
Galv. Open \$2.50 2.75 3.00 3.25 Jap. Open \$1.90 2.10 2.25 2.55	Tin'd Top. New Englan
Inch 15 16 17 18 Galv. Open \$2.50 2.75 3.00 3.25 Jap. Open \$1.90 2.10 2.25 2.55 Galv. Funnel \$3.00 3.00 3.90 3.90 Jap. Funnel \$2.45 2.65 2.85 3.30	F
Masons, Etc.	Pinking Iro
Cleveland Wire Spring Co.: Steel Mortareach \$1.45 Steel Brickeach \$1.10	Soldering C
Hoes— Eye-	Jacks,
Scovil and Oval Pattern	Jacks, Covert Mfg. Auto Screw.
604 1060 604 104 10 2	Steel Covert's Sadd
Grub, list Feb. 23, 1899	Steel Covert's Sadd Daisy Victor Lockport Lane's Steel Richards' Tig
Handled-	Lane's Steel Richards' Tig
NOTE. — Manufacturers are selling from the list of September	Kettles-
using list of August 1, 1899, or	Brass, Spui
Ft, Madison Cotton Hoe70&18&10%	Brass, Sput Enameled an Hollow.
relling at net prices. Addison Cotton Hoe70&18&10% Addison Crescent Cultivator Hoe, doz	Knives- Butch
Regular Weight	Foster Bros.' Smith & Hem
ct. Madison Sprouting Hoc. 3 doz. 50%	Wilkinson Sh
Kretsinger's Cut Easy	Withington Dent. \$2.75
N. & C. Ivanhoe	Withington Dent, \$2.75 Serrated, \$2. Yankee No.
B. B. 6% in	- E
	Standard L.C. E. Jenning Jennings & G Ohio Tool Co
See Machines, Hoisting. Holders— Bit—	
A	L. & I. J.
Door- Empire	Serrated E
	Iwan's Sickle Iwan's Serrat
Nicholson File Holders and File Handles 33%@40%	Buffalo
Fruit Jar-	Mis
Triumph Fruit Jar Holder, \$\psi\$ gross, \$10.80; \$\psi\$ doz	Farriers' Wostenholm's
Bird Cage, Reading	Base, 21/2-in
Clothes Line, Reading List50&10&107	Rubber ti Carriage, J
Clothes Line, Sargent's List. 50&20&10	
Come many	Door Mine
Clothes Line, Stowell's	Door, Mine Door, Por. Door, Por.
Clothes Line, Stowell's	Door, Mine Door, Por. Door, Por. Bardsley's Wo Picture. Sare
Nother Line Stowell's 70	Door, Por. Door, Por. Bardsley's Wo
Nother Line Stowell's 70 70 70 70 70 70 70 7	Door, Mine Door, Por. Door, Por. Bardsley's Wo Picture, Sarg
Belt	Door, Por. Door, Por. Bardsley's Wo Picture, Sarg Lacing, See Belt Ladders
Belt	Door, Por. Door, Por. Bardsley's Wo Picture, Sarg Lacing, See Belt Ladders
Belt	Door, Por. Door, Por. Bardsley's Wo Picture, Sarg Lacing, See Belt Ladders Lane's Store. Myers' Noise Richards Mfg Improved N Climax She
Belt	Lacing, See Beltt Lane's Store Myera' Noise Richards Mg Improved M Climax She Trolley, No
Belt	Lacing, See Bett Ladder: Lane's Store Myera' Noise Richards Mr Improved 'A Climax She Trolley N La & G, Mr E & S, Mr
Belt	Lacing, See Bett Ladder: Lane's Store Myera' Noise Richards Mr Improved 'A Climax She Trolley N La & G, Mr E & S, Mr
Belt .80&10@% Wire C. & H. Hooks: .75&10@75&10&5% Atlas, Coat and Hat: .75. 10 Cases. .75&10 10 Columbian Hdw. Co Gem. .90&10 Parker Wire Goods Co King. 75&10 Van Wagoner, Coat and Hat. .70 Western W. G. Co. Molding. .75	Door, Por. Door, Por. Bardsley's Wc Picture, Sarg Lacing, See Belt Ladders Lane's Store, Myera' Noise Richards Mfg Improved A Climax She Trolley No. Ladles, L. & G. Mfg P. S. & W. Reading Sargent's Lantern
Belt .86&10@% Wire C. & H. Hooks: .75&10@75&10&5% Atlas. Coat and Hat: .75&10@75&10 Single Cases. .75&10 10 Case Lots. .75&10 Columbian Hdw. Co., Gem. .0&10 Parker Wire Goods Co., King. 75&10 .75&10 Van Wagoner, Coat and Hat. .70 Western W. G. Co. Molding. .75 Wire Goods Co.: .60&10% Chief .70 Crown .70&10 Czar .65 V Brace. .70&10 Czar Harness .50&10	Door, Por. Door, Por. Bardsley's W. Picture. Sarg Ladder: Lane's Store Myers' Noise Richards Mfg. Improved A. Climax She Trolley. No. Ladles, L. & G. Mfg. P. S. & W. Reading. Sargent's Lantern Regular Tri
Belt .86&10@% Wire C. & H. Hooks: 75&10@75&10&5% Atlas, Coat and Hat: 75&10@75&10&5% Single Cases. .75&10 10 Case Lots. .75&10 Columbian Hdw. Co., Gem. .0&10 Parker Wire Goods Co., King. 75&10 Van Wagoner, Coat and Hat. Van Wagoner, Coat and Hat. .70 Wire Goods Co.: .60&10% Chief .70 Crown .70&10 Czar .65 V Brace. .70&10 Czar Harness .50&10	Door, Por. Door, Por. Bardsley's W. Picture, Sarg Lacing, See Belt Ladder: Lane's Store Myers' Noise Richards Mfg Improved A Climax She Trolley, N. Ladles, L. & G. Mfg P. S. & W. Reading Regular Te Lift Tubul
Belt .86&10@% Wire C. & H. Hooks: 75&10@75&10&5% Atlas, Coat and Hat: 75&10@75&10&5% Single Cases. .75&10 10 Case Lots. .75&10 Columbian Hdw. Co., Gem. .0&10 Parker Wire Goods Co., King. 75&10 Van Wagoner, Coat and Hat. Van Wagoner, Coat and Hat. .70 Wire Goods Co.: .60&10% Chief .70 Crown .70&10 Czar .65 V Brace. .70&10 Czar Harness .50&10	Door, Por. Door, Por. Bardsley's We Picture. Sarg Lacing, See Belt Ladders Lane's Store. Myers' Noise Richards Mfg Improved A Climax She Trolley. No. Ladles, P. S. & W. Reading. Lantern Regular Te Lift Tubule Hinge Tub
Belt .86610@. % Wire C. & H. Hooks: 75610@7541065 % Atlas. Coat and Hat: 75%10@7541065 % Single Cases	Lacing, See Belt Ladders Lane's Store Myers' Noise Richards Mfg Improved M Climax She Trolley. M Reading Sargent's Lantern Regular Te Lift Tubull Hinge Tub Other Style Bull's
Belt	Lacing, See Belt Ladders Lane's Store Myers' Noise Richards Mfg Improved M Climax She Trolley. M Reading Sargent's Lantern Regular Te Lift Tubull Hinge Tub Other Style Bull's
Belt	Door, Por. Door, Por. Bardsley's Wc Picture, Sarg Lacing, See Belt Ladders Lane's Store, Myers' Noise Richards Mfg Improved A Climax She Trolley. No. Ladles, L. & G. Mfg P. S. & W. Reading Sargent's Lantern Regular Ti Lift Tubula Hinge Tub Other Style Bull's No. 1, 2%-1 No. 2, 3-ind Lasts a
Belt	Door, Por. Door, Por. Bardsley's W. Picture, Sarg Lacing, See Bett Landers Store Myera' Noise Richards Mf. Improved A. Climax She Trolley. No. Ladles, L. & G. Mfg. P. S. & W. Reading. Sargent's Lantern Regular Ti Lift Tubul Hinge Tub Other Style Bull's No. 1, 2%-1 No. 2, 3-im Lasts a
Belt	Door, Por. Door, Por. Bardsley's Wc Picture, Sarg Lacing, See Beit Ladders Lane's Store. Myers' Noise Richards Mfg Improved N Climax She Trolley. No. Ladles, L. & G. Mfg P. S. & W. Reading Sargent's Lantern Regular Ti Lift Tubula Hinge Tub Other Style Buil's No. 1, 2%-1 No. 2, 3-int Lasts a Stowell's Bad Latches
Belt	Door, Por. Door, Por. Door, Por. Bardsley's Wc Picture. Sarg Lacing, See Belt Ladders Lane's Store. Myers' Noise Richards Mfg Improved N Climax She Trolley. No. Ladles, L. & G. Mfg P. S. & W. Reading Sargent's Lantern Regular Ti Lift Tubull Hinge Tub Other Style Bull's Bull's No. 1, 2%-i No. 2, 3-ine Lasts a Stowell's Atl Stowell's Bad
Belt	Door, Por. Door, Por. Door, Por. Bardsley's We Picture. Sarg Lacing, See Belt Ladders Lane's Store. Myers' Noise Richards Mfg Improved A Climax She Trolley. No. Ladles, L. & G. Mfg P. & W. Ladles, L. & G. Mfg P. & W. Lantern Regular Ti Lift Tubuli Hinge Tub Other Style Bull's No. 1, 2%-i No. 2, 3-im Lasts Stowell's Atl Stowell's Bac Latches Roggin's Le
Belt	Door, Por. Door, Por. Door, Por. Bardsley's We Picture. Sarg Lacing, See Belt Ladders Lane's Store. Myers' Noise Richards Mfg Improved N Climax She Trolley. No. Ladles, L. & G. Mfg F. & W. Reading Sargent's Lantern Regular Te Lift Tubult Hinge Tub Other Style Bull's No. 1, 2%-1 No. 2, 3-inc Lasts Stowell's Bac Latches Roggin's Le Richards' Ru Richards' Ru Richards' Te Leader
Belt	Door, Por. Door, Por. Door, Por. Bardsley's Wc Picture, Sarg Lacing, See Belt Ladders Lane's Store Myers' Noise Richards Mfg Improved N Climax She Trolley. No Ladles, L. & G. Mfg P. S. & W. Reading P. S. & W. Reading Lantern Regular Ti Lift Tubule Hinge Tub Other Style Buil's No. 1, 2%-in Lasts a Stowell's Ati Stowell's Bac Latches Roggin's Le Richards' Ri Richards' Ri Richards' Ri Richards' Tr

	THE IRO	
- 1	Horse Nails-	
ist	See Nails, Horse,	
%	See Shoes, Horses.	
1006	Hose, Rubber-	
10@	Garden Hose. 34-inch: Competition	
160	4-ply Standardjt. 10 @11 ¢ 3-ply extrajt. 11 @13 ¢	
40	4-ply extraft. 14 @16 ¢ Cotton Garden, %-in., coupled:	
	Low Gradeft, 8 @ 9 ¢ Fair Qualityft. 10 @ 11 ¢	
6	rons- Sad-	
	From 4 to 10 lb. 254@3 \$\psi\$ B. B. Sad Irons lb. 354@35/2\$\psi\$ Chinese Laundry . lb. 454@5 \$\psi\$ Chinese Sad lb. 4 @44/4 Mrs. Patty' gents new set.	
35%	Chinese Laundrylb. 43465 ¢ Chinese Sadlb. 4 @444¢	
oz. 18		
3.25 2.55	Nos	
3.90 3.30	Pinking-	
	Pinking Ironsdoz.50@60¢ Soldering-	
1.45	Soldering Coppers, 21/2 & 3.20@21¢ 11/2 & 2	
	Jacks, Wagon—	
0%	Covert Mfg. Co.: 30&5% Auto Screw 30&5% Steel 45&2% Covert's Saddlery Works: 60&10%	
0%	Daisy	
	Daisy	
ber	Kettles-	
or	Brass, Spun, Plain20@25% Enameled and Cast Iron—See Ware, Hollow.	
10%		
e, 19%	Knives— Butcher, Kitchen, &c	
%% 4.00 50%	Foster Bros.' Butcher, &c30% Smith & Hemenway Co40&10% Wilkinson Shear & Cutlery Co50%	
	Corn-	
10%	Withington Acme. 10 doz., \$2.65; Dent, \$2.75; Adj. Serrated, \$2.20; Serrated, \$2.10; Yankee No. 1, \$1.50; Yankee No. 2, \$1.15.	
10% 10% 10% 22% 3.15 3.35 4.35 4.85	Dunassima	
4.85	Standard List	
	Jennings & Griffin, Nos. 41, 4260% Ohio Tool Co.'s70% Swan's 70&10&24.	
10%	15. W. 1. 0. 11 111 C	
50% 45%	Serrated Edgeper doz. \$5.25@5.59	
	Iwan's Sickle Edge doz. \$9.50 Iwan's Serrated doz. \$10.00	
le 40%	Mincing— Buffalo	
6, 1.25	Miscellaneous— Farriers' doz. \$3.00@3.25	
	Farriers'	
40 % 10 % 10 %	Base, 21/2-inch, Birch, or Maple,	
40 %	Rubber tipgro.\$1.15@1.20 Carriage, Jap., all sizes gro. 40@45¢	
10 % 10 % 70 % 20 %	Door, Mineral	
70% 65% 40%	Door, Por. Nickel. doz. \$2.05@2.15 Bardsley's Wood Door, Shutters, &c.15%	
60% 70%	Lacing, Leather—	
.%	See Belting, Leather-	
5%	Landers, Store, &c.—	
75%	Lane's Store. 25% Myers' Noiseless Store Ladders. 50% Richards Mfg. Co.: Improved Noiseless, No. 112. 40% Climax Shelf, No. 113. 40% Trolley, No. 109. 40% Ladles, Melting.	
10% 10% 10% 70% 75%	Climax Shelf, No. 113	
75%	Ladles, Melting— L. & G. Mfg. Co. (low list)25%	
10% 70% 10% 65% 10%	L. & G. Mfg. Co. (low list)	
10%	Lanterns-Tubular-	
10/0	Regular Tubular, No. 0 doz. \$4.25@4.85 Lift Tubular, No. 0	
in.,	Hinge Tubular No. 0	
1.25 ods.	doz. \$4,50@5.15 Hinge Tubular, No. 0	
	Bull's Eye Police- No. 1, 24-inch\$2.50@2.75	
m, 6.25	No. 2, 3-inch82.75@3.00	
1.50	Stowell's Atlas, Malleable Iron50% Stowell's Badger, Cast Iron50% Latches— Thumb—	
11.30	Latches— Thumb—	-
100/	Roggin's Latches, with screw doz. 35@40¢ Door-	
10% tle .35%	Richards' Rull Dog, Heavy, No. 125,40%	
.30% ng .60%	Leaders, Cattle— Smalldoz. 50¢; large, 60¢ Covert Mfg. Co	
net	Covert Mfg. Co	
	R. & E334%	-

JN AGE	April 0, 1905
Lines— Wire Clothes, Nos. 18 19 20 100 feet\$2.20 2.00 1.65 75 feet\$1.80 1.70 1.39 Samson Cordage Works: Solid Braided Chalk, Nos. 0 to 3.40% Silver Lake Braided Chalk, No. 0, \$6.09, No. 1, \$5.50, No. 2, \$7.09; No. \$7.09; No. 1, \$5.50; No. 2, \$7.09; No. \$8.50 No. 1, \$5.50; No. 2, \$7.09; No. \$1.75; No. 1, \$2.50; No. 2, \$3.50; No. 10, \$2.50; No. 10, \$3.50; No. 10, \$2.50; No. 10, \$3.50; No. 10, \$3.50; No. 10, \$3.50; No. 10, \$4.50; No. 10, \$3.75; 75; ft. \$4.00; 80 ft. \$3.25; 70 ft. \$3.75; 75; ft. \$4.00; 80 ft. \$4.25; 90 ft. \$4.75; 100 ft. \$5.25; No. 10, \$4.25; 90 ft. \$4.	Horse— Nos. 6 7 8 0 10 Anchor
White Cotton, \$4.50; Drab Cotton; \$3.50. Clothes Lines, White Cotton; 50 ft., \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75; 100 ft., \$4.55; 100 ft., \$4.75; 100 ft., \$5.25. 200; Air Line, \$22.00; Acme, \$17.00; Alabama, \$15.00; Empire, \$14.00; Advance, \$13.50; Oriole, \$20.00; Albemarle, \$13.50; Oriole, \$20.00; Albemarle, \$13.50; Cotton, \$12.50; Chicago, \$11.00; Standard, \$10.00; Columbia, \$8.50; Allston, \$12.50; Calhoun, \$11.00. Locks— Cabinet—	Square, Blank. \$4.80 Hexagon, Blank. \$5.30 Square, Blank, C. T. & R. \$5.00 Hexagon, Blank, C. T. & R. \$5.70 Hot Pressed: Mfrs., U. S. or Nar. Gauge Stan'd. Square, Blank. \$5.30 Hexagon, Blank. \$5.70 Square, Tapped. \$5.20
Door Locks, Latches, &c.— NOTE.—Net Prices are very often mede on these goods. Reading Hardware Co	Square, Tapped \$5.20
Stowell's Padlocks	In carload lots \(\frac{1}{4} \circ \text{ib. off, f.o.b.} \) New York, Oll Tanks—See Tanks, Oil. Ollers— Brass and Copper 50&10% Tin or Steel 65&10% Chase or Paragon:
Ives' Patent: Bronze and Brass	### Chase or Paragon: Bruss and Copper
Com. Upr't, without Augers 32.00 Com. Any'l'r, without Augers 32.25 R. & E. Mfg. Co.: Upright. Angular, Improved No. 4.3.75 No. 2.3.38 Improved No. 5. 2.75 Jennings. Nos. 1 and 4	Can Per doz.
Reisinger Invincible Hand Power *** dos. \$48.00 Fence— Williams' Fence Machineseach, \$5.50	Packing— Asbestos Packing, Wick and Rope
Hoisting— Moore's Anti-Friction Differential Pulley Block	Rubber (Fair quality goods.) Sheet, C. I. Sheet, C. O. S. 9@13¢ Sheet, C. O. S. 9.013¢ Sheet, C. O. S. 9.013¢ Sheet, Pure Gum 50@55¢ Sheet, Pure Gum 50@55¢ Jenkins' 96, P. D. 80¢ 5.025¢5½ Miscellaneous American Packing Ib, 7@10 ¢ Cotton Packing Ib, 16@25¢ Italian Packing Ib, 16@25¢ Italian Packing Ib, 16@25¢ Jute Ib, 4@ 4½¢ Jute Ib, 4@ 4½¢ Russia Packing Ib, 8@11¢ 50%11¢ 10%11¢
Hickory	Pails, Creamery— 8. 8. & Co., with gauges—No. 1, \$6.25; No. 2, \$6.50 \$\pi\$ doz. Pails, Water, Well, &c.— See Buckets. Pans— Dripping— Standard List.60&10@60&10&12\frac{12}{2}\frac{1}
Mats, Door— Elastic Steel (W. G. Co.)	Common Lipped: Nos 1 2 3 4 5 Per doz 9.75 0.80 0.90 1.10 1.30 Refrigerator, Galva.— Inch 12 14 16 18 Per doz 31.95 2.25 2.80 3.15 Roasting and Baking— Regal, S 8 & Co \$\psi\$ doz. Nos. 5, \$4.50; 10, \$5.25; 20, \$3.75; 30, \$6.25. Savory \$\psi\$ doz. net, Nos. 200, \$3.00; 400, \$15.00.
Mowers, Lawn	\$\frac{9}{400}\$, \$\frac{10}{400}\$, \$\frac{15}{400}\$, \$\frac{15}{40
Styles M. S. C. K. T 70&5% Style A. all Steel 60&5% Style E. High Wheel 70&10&5% Drexel and Gold Coin, special list.50%	Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll 350/96 Medium weight, 30 lbs. to roll. Heavy weight, 40 lbs. to roll.
Wire Nails and Brads, Papered, List July 20, 189985&10&10@90? Cut and Wire. See Trade Report, Hungarian, Fluishing, Upholster- ers' &c. See Tacks.	Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, \$1.10; 4 ply, \$1.25. Deafening Felt, 9, 6 and \$4½ sq. ft. to lb. ton

Tarred Paper— 1 ply (roll 300 sq. ft.), ton	P., S. & W. Tinners' Cutting Nip- pers	Pulleys, Single Wheel— Inch	Note. —
\$32.50@35.50 2 ply, roll 108 sq. ft55@60¢	Utica Drop Forge & Tool Co.:	Awning or Tackle, doz \$0.30	selling from 1, 1904, but 1
3 pty, roll 108 sq. ft78@85¢ Slater's Felt (roll 500 sq. ft.) .75¢	Pliers and Nippers, all kinds40% Plumbs and Levels—	doz., 4 in., \$1.25; 5 in., \$1.55	using list of seiling at ne
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.)\$2.75	Chapin-Stephens Co.: Plumbs and Levels30@30&10&10%	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Fort Madison Fort Madison
Sand and Emery— Flint Paper and Cloth.60@60&10%	Chapin's Imp. Brass Cor. 40@40&10&10 Pocket Levels30@30&10&10	Screw, doz \$0.16 .19 .23 .30	Jackson Lawr doz., net Cronk's:
Garnet Paper and Cloth 25%	Disston's Plumbs and Levels	Stae, doz \$0.25 .40 .55 .60	New Champ teeth, \$15.00
Emery Paper and Cl'h.50&10@60% Parers— Apple—	C. E. Jennings & Co.'s Iron, Adjust- able	Inch 1½ 1¾ 2 2½ Stowell's: Ceiling or End. Anti-Friction. 60&10%	Victor Gard
Advance 2 doz. \$4.00 Baldwin 2 doz. \$4.00	able R. & L. Co. 45/8 Stanley R. & L. Co. 45/8 Stanley's Duplex. 35/8 Woods' Extension. 333/4/8	Ceiling or End, Anti-Friction60&10% Dumb Waiter, Anti-Friction60&10% Electric Light	\$15.00; 14, Queen City \$3.45; 24, \$
Bonanza Improvedeach \$6.50 Daisy	Poachers, Egg-	Side, Anti-Friction60&10% Sash Pulleys—	Anticlog La Malleable G Kohler's;
Eure a Improvedeach \$20.00 Family Bay State doz. \$15.00	Buffalo Steam Egg Poachers, # doz., No. 1, \$6.00; No. 2, \$9.00; No. 3, \$9.00; No. 4, \$12.00	Common Frame; Square or Round End, per doz, 134 and	Lawn Queen Lawn Queen
Improved Bay State	Points, Glaziers'	2 111	Paragon, 20- Paragon, 24- Steel Garde
Parers	Bulk and 1-lb. papers, lb. 81/2@9 \$	Auger Mortise, no Face Plate, per doz., 134 and 2 in. 16@19¢ Acme	Steel Garde Malleable G
Rocking Table	1/2-lb. paperslb.9 @91/4¢ 1/4-lb. paperslb.9%@101/4¢	Fox-All-Steel, Nos. 3 and 7, 2 in	Rasps,
Potato-	Ft. Madison Hawkeye doz. \$3.25 Ft. Madison Western doz. \$4.00	Grand Rapids All Steel Noiseless. 50% Ideal	
Saratoga a doz. \$7.00 White Mountain a doz. \$6.00	Police Goods—	Ideal	Disston's Heller Bros.'. McCaffrey's A New Nicholson
Picks and Mattocks— List Feb. 23, 189970&5@75% Cronk's Handled Garden Mattock	Manufacturers' Lists25@25&5% Tower's	Pumps—	See also Fil
# doz., \$6.40	Polish—Metal— Prestoline Liquid, No. 1 (½ pt.), 1	Cistern	Th
Pinking Irons— See Irons, Pinking.	doz., \$3.00; No. 2 (1 qu.), \$9.7240% Prestoline Paste	Pitcher Spout	Fox Razors, Fox Razors,
Pins, Escutcheon-	U. S. Metal Polish Paste, 3 oz. boxes, 39 doz. 50¢; 39 gro. \$4.50;	Barnes' Fitcher Spout	Red Devil
Brass	½ lb boxes, \$\pi \doz, \$1,25; 1 lb boxes, \$\pi \doz, \$2.25.	Daisy Spray Pump Ø doz. \$7.20 Flint & Walling's, Fast Mail Hand,	Silberstein: Carbo Magn Griffon, No
Pipe, Cast Iron Soil— Carload lots.	\$1.25; \$1 gro., \$12.00. Barkeepers' Friend Metal Polish.		Griffon, No Griffon, No All other B
Standard, 2-6 in	Polish	White & Walling's Wight Ton Ditches 2007	Safe
Fittings	Stove-	National Specialty Mfg. Co., Measuring, \$6.00 30% Mechanical Sprayer 57.20 Myers Pumps (low list) 50% Myers Power Pumps 50%	Silberstein
Pipe, Merchant— Carload Lots.	Stove— Black Eagle Benzine Paste, 5 lb cans, # lb l0¢ Black Eagle, Liquid, ½ pt. cans. doz. 75¢	Myers' Power Pumps	Hendryx:
Steel. Iron. Blk. Galv. Blk. Galv.	Black Jack Paste, % Ib cans, \$9 gr. \$9.00	Pump Leathers-	M 6, Q 6, Q 16, A Populo, N
76 & 74 in 6774 % 5174 % 6574 % 1974 % 18. & 71 19. % 5974 % 6974 % 5774 % 34 to 6 in 7574 % 6574 % 74 % 64 % 7 to 12 in 7074 % 5574 % 69 % 5574 %	Black Jack Paste, % Ib cans, \$\forall doz. 75 \epsilon\$ Black Kid Paste, 5 Ib can. each, \$9.65 Ladd's Black Beauty, gr. \$10.00.59; Joseph Dixon's, \$\forall gr. \$5.75.	Plunger and Lower Valve—Per gro.:	Aluminum. 1240 N. 124 N 3004 N. 06 N 4 N. 6 PN. 2904 P. 2904 PN.
34 to 6 in 751/2% 651/2% 74 % 64 % 7 to 12 in 701/2% 551/2% 69 % 531/2%	Dixon's Plumbago	Inch 2 21/4 21/2 23/4 82.20 2.50 2.75 3.00 Inch 3 31/4 31/2 33/4 4	4 N, 6 PN, 2904 P
Pipe, Sewer— Carload lots.	Gem, % gr. \$4.50	\$3.30 3.60 3.80 4.10 4.40	DOUBLE ATTACK
Standard Pipe and Fittings, 2	Peerless Iron Enamel, 10 oz. cans	Plunger Cup Leathers—Per 100: Inch 2½ 3 3½ 4 \$2.75 3.85 5.00 6.00	
to 24 in.: New England	Wynn's: Black Silk, 5 fb paileach 70¢	Punches-	802 N 986 PN. 290: 5009 PN. 50
Maryland, Delaware, E. Pa.78% West. Pa. and West Va80%	Black Silk, 5 lb paileach 70 ¢ Black Silk, ½ lb box	Saddlers' or Drive, good doz. 50@75¢	Competitor. 202 PN, 10 304 P, 304 P
Virginia	Poppers, Corn— 1 qt., Squaregro. \$9.00	Spring, single tube, good qual- ity\$1.75@2.00	Registe
Indiana	1 qt., Round	Revolving (4 tubes)	Black Jap. Bronzed
livered.	2 qt., Squaregro. \$13.00	Bemis & Call Co.'s Cast St'l Drive.50% Bemis & Call Co.'s Check	Single Acti
Pipe, Stove— Edwards' Nested Stove Pipe: C. L. L. C. L.	Post Hole and Tree Au- gers and Diggers—	Bemis & Call Co.'s Cast St'l Drive.50% Bemis & Call Co.'s Check	Double Act
5 in., per 100 joints\$7.00 \$8.00	See also Diggers, Post Hole, &c. Posts. Steel—	Hercules, each \$7.50	Automatic Hammerles:
6 in., per 100 joints 7.50 8.50 7 in., per 100 joints 8.50 9.50 Planes and Plane Irons	Steel Fence Posts, each, 5 ft., 426:	Tinners' Hollow, P., S. & W. Co. 35@35&5% Tinners' Solid, P., S. & W. Co.	NOTE Jo above prices o
Wood Planes-	6 ft., 46¢: 6½ ft., 48¢. Steel Hitching Postseach \$1.30	doz., \$1.4460%	Riddles
Bench, first qual40&10% Bench, Second qual50&10%	See Parers, Potato.	Rail-Barn Door, &c	16 in
Bench, Second qual 394,610% Molding 334,610% Bailey's (Stanley R. & L. Co.) 40% Chapin-Stephens Co. Bench, First Quality 40@40&10% Bench, Second Quality 50@50&10% Molding 354@335&10% Toy and German 40@40&10% Chaplin's 60%	Pots, Glue— Enameled	Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:	
Beuch, First Quality40@40&10% Bench, Second Quality50@50&10%	Powder—	1/2	Rings a
Molding	In Canisters: Duck, 1 lbeach 456	Angular for Sq. Groove Wheels: Small. Med. Large.	Steel
Ohio Tool Co.: Bench, First Quality40@40&10%	Duck, 1 lbeach 45¢ Fine Sporting, 1 lbeach 75¢ Rifle, ½-lbeach 15¢	\$2.00 \$2.70 \$3.60 100 feet. Sliding Door, Painted Iron	Copper Rea's Improv
Toy and German	Rifle, 1-lbeach 25¢	21/26723/20	Rea's Improvement 2 in., \$1.50; 3 in.,
Iron Dianes—	12½-lb. kegs\$2.50 25-lb. kegs\$4.50	Sliding Door, Wrought Brass, 11/6 in., 1b., 36 ¢	Hog Rin
Bailey's (Stanley R. & L. Co.)40% Chaplin's Iron Planes	King's Semi-Smokeless; Keg (25 lb bulk)\$6.50		Hill's Ring
Bailey's (Stanley R. & L. Co.)	King's Semi-Smokeless: Keg (25 b bulk). \$6.50 Half Keg (12½ b bulk). \$3.50 Quarter Keg (6½ b bulk). \$1.90 Case 24 (1 b cans bulk). \$4.50 Half case (1 b cans bulk). \$4.50 King's Smokeless: Shot Gun. Rife. Keg (25 b bulk). \$1.20 \$15.00 Half Keg (12½ b bulk). 6.25 7.75 Quarter Keg (6½ b bulk). 3.25 4.00 Case 24 (1 b cans bulk). 14.00 17.00 Half case 12 (1 b c k). 7.25 8.75 Robin Hood Sm'less Shot Gun. 50&20%	Double Braced Steel Rail # ft. 3¢	Hill's Ringe
Ohio Tool Co.'s Iron Planes60% Sargent's60&10%	Half case (1 fb cans bulk)\$4.50 King's Smokeless: Shot Gun, Riffe.	xxx, \$\frac{1}{2}\$ 100 ft., 1 x 3-16 in., \$3.00;	Blair's Rin Blair's Rin
Plane Irons—	Half Keg (12½ fb bulk) \$12.00 \$15.00 Half Keg (12½ fb bulk) 6.25 7.75 Ouarter Keg (6¼ fb bulk). 3.25 4.00	Griffin's: xxx, \$\forall 100 \text{ ft., 1 x 3-16 in., \$3.00;} 1\forall x 3-16 in., 3.50. Hinged Hanger, \$\forall 100 \text{ ft., 1 x 3-16 in., \$3.10; 1\forall x 3-16 in., \$3.60.} Lane's:	Brown's Ri Brown's Ri
Wood Bench Plane Irons 25&10@30%	Case 24 (1 fb cans bulk). 14.00 17.00 Half case 12 (1 fb c, bk). 7.25 8.75	Himmed Track 30 100 60 1 in \$2 70.	Diverse
Buck Bros	Robin Hood Sm'less Shot Gun50&20%	11% in., \$4.40. O. N. T., \$2 100 ft., 1 in., \$2.75; 11% in., \$3.50; 11½ in., \$4.00. Standard, 11½ in., \$4.00. \$9 100 ft. \$4.00	Copper Iron or Ste
Ohio Tool Co	Fruit and Jelly-	Standard, 1¼ in	
Union	Seal Presses— Morrill's No. 1, # doz., \$20.0050%	Lawrence Bros.: \$\frac{1}{2}\$ 100 ft. No. 201, \$4.00; No. 202, \$4.40. New York, 1 x 3-16 in., \$\frac{1}{2}\$ 100 ft. \$2.75 McKinney's:	Acme, Stowel Barn Door, S Cronk's Stay,
Planters, Corn, Hand— Kohler's Eclipse	Pruning Hooks and Shears	Hinged Hanger Rail, \$\mathcal{B}\$ ft., \$11\psi\$, .50% None Better	Cronk's Brink Lane's Stay
Plates-	See Shears. Pullers, Cork—	Standard	Handy Adj.
Felloe	Invincible Cork Puller\$21.00 Pullers, Nail—	Common 1 x 3-16 in., \$2.75; 11/4 x 3-16, \$3.25; 11/4 x 3-16, \$3.50.	Barn Door, Cronk's Stay. Cronk's Brinl Lane's Stay Richards' Sta Handy Adj. O. K. Adj.; Lag Screw, Fire Door, Favorite. N Stowell's Bar Swett's Anti.
Pliers and Nippers-	Cyclops	Fire Door Track, & ft., 2½ x %,	Stowell's Bar Swett's Anti-
Button Pliers		New York, 1 x 3-16 in., \$\phi\$ 100 ft. \$2.75 \\ McKinney's; Hinged Hanger Rail, \$\phi\$ ft., \$16.50 \\ None Better	Swett's Anti- Screw and I Hinge Adju
@ \$1.30; 6 in., \$1.45 @ \$1.50. Gas Pipe. 7 8 10 12-in.	Pearson No. 1, Cyclone Spike Puller, each \$30.00	Safety Door Hanger Co.'s Storm	Rope-
Button Pliers	Scranton, Case Lots: No. 2B (large)	Safety Door Hanger Co.'s U. S. Standard	Manila, 7-16 Pure Sisal, 7-16 is
Cronk & Carrier Mfg. Co.: American Button	Morrill's No. 1, Nail Puller, # doz. \$20.00	Stowell's: Cast Rail	
Improved Button60&10 % Stub's Pattern50%	Diamond B. No. 2, case lots	Cast Rail. Plain. 25 ft. 1% c Steel Rail. Plain. 25 ft. 25 ft. Wrought Bracket. 1 3-16 in. 19 ft. 3 c Wrought Bracket. 1 12 x 5-16. 19 ft. 7 ft. 2 ft. 11 c P. L. B. Steel Rail. 19 100 ft. 32.75 No. 0, 1 x 5-16. 19 100 ft. 32.75	Pure Sisal, Hay
American Button 58-102 Cronk's 904 Improved Button 604:102 Stub's Pattern 502 Combination and others 3344 Heller's Farriers' Nippers Pincers and Tools. 904:106:106/104107	Diamond B, No. 3, case lots	Swett's Hylo. # ft. 11¢	Ropes, A
and 10015	\$16.50; No. 3, \$15	No. 0, 1 x 3-16 № 100 ft. \$2.75	Pure

— Manufacturers are m the list of September

1, 1904, but many jobbers are still
using list of August 1, 1899, or
selling at net prices.
Fort Madison Red Head Lawn\$3.25
Fort Madison Blue Head Lawn\$2.70
Jackson Lawn, 29 and 30 teeth, 3
doz., net\$4.25
Cronk's:
New Champion Garden, # doz., 12
teeth, \$15.00; 14, \$16.50; 16, \$18.0075%
Victor Garden, P doz., 12 teeth,
\$15.00; 14, \$16.50; 16, \$18.0075&25%
Queen City Lawn, \$\mathref{a}\ doz., 20 teeth,
\$3,45; 24, \$3.60
Anticlog Lawn, P doz\$4.00
Malleable Gardon
Kohler's:
Lawn Queen, 2000th doz. \$3.45
Lawn Queen, 24-tooth 3 doz. \$3.50
Paragon, 20-tooth
Paragon, 24-tooth
Steel Garden, 14-tooth 2 doz. \$2.88
Malleable Garden, 14-tooth, & doz.
\$1.75(a2.00
Weldless Steel Garden75&5%
Rasps, Horse-

Disston's75	9/	
Disston's 75	100	
Heller Bros.'70&5@70&10&5	82	
TACTICE AND COLORS	-52	
McCaffrey's American St'd60&10&5	Z	
70 0 10/-75		
New Nicholson	10	
See also Files		

Hazors	
Fox Razors, No. 42 doz. \$20.00)	6
12 - 12 No. 44 50 3 600 00 1	2
Fox Razors, No. 12, Platina	*
Fox Razors, No. 22, Platina Platina Adoz. \$25.00 Square Red Devil	2/
Silberstein:	
Carbo Magnets\$18.0	
Griffon, No. 65	JU W
All other Razors40	Z

fety Razors-

Fishing—

riceis, risning-
Hendryx: M 6, Q 6, A 6, B 6, M 9%, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo20%
Aluminum German Silv., Bronze 25% 1240 N. 124 N. 20%
3004 N. 06 N. 6 RM. G 9 257
4 N, 6 PN, 24 N, 26 PN20% 2904 P
2904 PN
002904 PN
802 N
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR, 203 304 P, 304 PN, 00304 P, 00304 PN, 3314
Registers—List July 1, 1903.

rers-

Single	Action .					95	06	18	1.0
Doubl	e Action.	. ex	cep	t.	14	C	ıl	. 8	1.8
Double	e Action	. 44	cal	lib	er			. 8	2.0
Auton	atic				. *			. 8.	3.4
Hamn	erless							. 8	4.0
	. — Jobber rices of m								

s, Hardware Grade

....per doz. \$2.25@82.50per doz. \$2.50@82.75per doz. \$2.75@83.00 and Ringers—

and Ringers—
Bull Rings—
\$ 2½ \$ \$inch.
\$ 0.70 0.75 0.80 doz.
\$ 1.50 1.15 1.14 doz.
roved Self-Piercing, Cop.
\$ doz., \$1.25; 2½ in.,
\$ 1.51.5.

ings and Ringers—
igs, gro. boxes.\$4,00@4,50
igers, Gray Iron......
doz.50@55¢
igers, Malleable Iron...
doz. 70@75¢
tings...per gro.\$4,75@5.25
ingers.per doz. 80,60@ .65
Ringers.per doz.80,60@ .65

and Burrs— 50&10@60% teel......75@75&5% well's Anti-Friction.....50%

Barn Door, Sargent's list60
Cronk s Stay
Cronk's Brinkerhoff90
Lane's Stay40
Richards' Stay:
Handy Adj. and Reversible No. 53.50
O. K. Adj. and Reversible, No. 58.50°
Lag Screw, Nos. 55 and 5750°
Fire Door, No. 5940
Favorite, No. 5440
Stowell's Barn Door Stay \$3 doz. \$1.0
Swett's Anti-Friction50°
Screw and Spike Stay 2 doz. 656
Hinge Adjustable Stay 2 doz. 90 c
Rope—
Manila " 10 in diam and larger

Manila, 7-16 in, diam, and larger:
Pure
Sisal, 7-16 in, diam, and larger:
Mixed
Pure
Sisal, Hay, Hide and Bale
Ropes, Medium and Coarse:
Mixed
Pure

1220	THE IRO	ON AGE	April 6, 1905
Sisal, Tarred, Medium Lath Yarn: Mixed	Lester, complete, \$10.00	Disston's Star and Monarch	Sieves, Wooden Rim— Nested, 10, 11 and 12 Inch. Mesh 18, Nesteddoz. \$0.90@0.95 Mesh 20, Nesteddoz. \$1.00@1.05 Mesh 24, Nesteddoz. \$1.30@1.40
Best, ¼-in. and larger16¢ Medium, ¼-in. and larger14¢ Common, ¼-in. and larger.10½¢ Jute Rone:	Scales— Family, Turnbull's50@50&10% Counter: Hatch. Platform, 14 oz. to 4	Giant Royal, Cross Cut. 9 doz. \$8.50 Royal, Hand 9 doz. \$5.00 Taintor Positive 9 doz. \$6.75	Sinks. Cast Iron— Standard list
Thread No. 1, ¼-in. & up. lb. 6¼4 Thread No. 2, ¼-in. & up. lb. 5¾¢ Old Colony Manila Transmission Rope — # lb 11½¢ Wire Rope—	lbs	Fox Shaving Sets, No. 30	Skeins, Wagon
Galvantzed 42\\\42\\\42\\\42\\\\72\\\72\\\72\\\72\	Chatillon's:	Shaves, Spoke—	Factory Shipments. "D" Slates50@50&10% Eureka, Unexcelled Noiscless 60&5 tens
Sisal	Union or Family No. 2 in 30 Portable Platform (reduced list)50 Wagon or Stock (reduced list)50 "The Standard" Portables	Wood a doz \$1.75@2.25 Railey R. & L. Co.)	Victor A, Noiseless
Ivory 35&10@35&10&5% Chapin-Stephens Co. Boxwood .60a60&10 Ivory .35a35&10&10 Miscellaneous .50a50&10&10 Combination .55a55&10	Scrapers Box, 1 Handle doz. \$2.00@2.25 Box, 2 Handle doz. \$2.60@2.85 Ship Light, \$2.00; Heavy, \$4.50	Shears— Cast Iron 7 8 9 in. Best\$16.00 18.00 20.00 gro. Good\$13.00 15.00 17.00 gro. Cheap\$5.00 6.00 7.00 gro.	German 40@40&10% Covert Mfg. Co.; Derby 30&5&2 High Grade 45 Jockey 30&10 Trojan 45
Combination 55005621/8 Stationers 10@10&10/8 Kenffel & Esser Co.; Folding, Wood 35&10/8 Folding, Steel 335&10/8 Lufkin's Steel 50&10/8 Lufkin's Lumber 60%	Adjustable Box Scraper (S. R. & L. Co.), \$6.00	Straight Trimmers, &c.: Best quality, Jap70\(.0\d.10\) Best quality, Nickel60\(\alpha\)60\(\d.6\d.0\) Fair quality, Jap80\(\alpha\)80\(\d.6\d.0\) Fair quality, Nickel\(\d.7\d.0\d.0\d.0\d.0\d.0\d.0\d.0\d.0\d.0\d.0	Trojan
Stanley R. & L. Co.: 62½% Boxwood	Air Line Pattern Screens60&10% Flyer Pattern Screens60&10660&10&5% Maine Screen Frames40&10&5 Perfection Screens60&10660&10&5 Phillips' Screen Frames60&6060&10%	Tatlors' Shears	Model 60% Triumph 60% Oneida Community: Solid Swivel 60% Sargent's Patent Guarded 66%&10 Snaths—
Miscellaneous	See also Doors. Screws—Bench and Hand Bench, Iron, doz., 1 in., \$2,50@ 275-114, \$2,00@325-114, \$3,50@3.75	Wilkinson's Sheep, 1900 list50% Tinners' Snlps— Steel Blades2045@20410% Steel Laid Blades40410@50% Forged Handles, Steel Blades, Berlin,	Scythe
See Balance, Sash. Sash Locks— See Locks, Sash.	Bench, Wd. Beech. doz. 396339645 % Hand, Wood	Heinisch's Snips. 40@40&10"	Good Quality 50&10@60&5% Cheap
Sash Weights— See Weights, Sash. Sausage Stuffers or Fillers See Stuffers or Fillers, Sausage.	Coach, Lag and Hand Rail— Lag, Cone Point, list Oct. 1. '99	P. 8. & W. Co	Hamilton Hokels & Bro. William Rogers & Bro. William Rogers Eagle Brand. 50&10' Anchor, Rogers & Brand. 60' Wm. Rogers & Son. 60&10' Miscellaneous—
Saw Frames. See Frames, Saw. Saw Sets.—See Sets, Saw. Saw Tools.—See Tools, Saw.	Hand Rail, list Jan. 1, '81 70&10@75% Jack Screws- Standard List75&10@80&5% Willows Palls	Disston's Combined Pruning Hook and Saw, \$\psi\$ doz. \$18.00	German Silver
Saws— Atkins:	Millers Falls	Grape	Springs— Door—
Mulay, Mill and Drag. 55% One-Man Saw. 40% Wood Saws. 40% Hand, Compass, &c. 40% Chapin-Stephens Co.; Turning Saws and Frames30@30&10%	List Jan. 1, '98; Flat or Round Head, Iron 50@50&10% Flat or Round Head, Brass 50@50&10%	Stowell's Anti-Friction	Gem (Coil) 29 Pullman (Coil) 29 Reliance (Coil) 40&10 Star (Coil) 39 Torrey's Rod, 39 in \$\frac{1}{2}\$ doz \$1.10 Victor (Coil) 50&10&10 Carriage, Wagon, &c.—
Diamond Saw & Stamping Works. Sterling Kitchen Saws30&10&5% Disston's: Circular, Solid and Ins'ted Tooth.50% Band, 2 to 14 in, wide	Set and Cap— Set (Iron or Steel) .80@80&10&10% Sq. Hd. Cap	Sliding Shutter- Reading list	1½ in. and Wider: Per lb Black 4@444 Half Bright 4a444 Bright 442a44 Painted Seat Springs: 442a444
Narrow Crosscuts	Wood- 65@65&10%	Brass Shells, Empty: First quality, all gauges60&5%	1½ x 2 x 26. per pr. 424 1½ x 3 x 28. per pr. 704 Sprinklers, Lawn— Enterprise 256303 Philadelphia No. 1, \$\P\$ doz. \$12; No. 2, \$15; No. 3, \$24
Woodsaw Blades	Flat Head, Iron	Climax, Chub, Rival, 10 and 12 gauge 65&5, Paper Shella, Empty; Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge .25&5, Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge, .20%, Climax, Union, League, New Rival,	2, \$15; No. 3, \$24
C E. Jennings & Co.'s: Back Saws	Scroll Saws— See Saws, Scroll.	Chmax, Union, League, New Rival. 18 and 12 gauge	T-Bevels 604.604.002709 Iron Hdl. Try Squares and T-Bevels 404.604.404.604.00 Disston's Try Sq. and T-Bevels
Millers Falls: Butcher Saws	Scythes— Per doz. Prices announced for next season: Clipper Pattern, Grass	Shells, Loaded— Loaded with Black Powder40% Loaded with Smokeless Powder, medium grade	1, 40%; No. 2
One-Man Cross Cuts	Clipper, Grain .88.25 Weed and Bush .86.25 Seeders, Raisin— Enterprise .25@30%	Loaded with Smokeless Powder, high grade	Cheap
Hand Saws. 25a258.7½ Hand Saws. Bay State Brand. 45 7 Compass. Key Hole. &c. 25a258.7½ Wood Saws. 55a358.7½ Springfield Mach. Screw Co. 15a356.7½ Springfield Mach. Screw Co. 15a356.7½ Springfield Mach. Screw Co. 15a56.7½ Wheeler, Madden & Clemson Mfg. Co. 2 Cross Cut. Saws. 50%	Sets— Awl and Tool: Aiken's Sets, Awl and Tools: No. 20, 49 doz. \$10.0050&10&10". Fray's Adj. Tool Handles, Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$9; 5, \$750% C. E. Jeunings & Co.'s Model Tool	Shoes, Horse, Mule, &c	Staples— Barbed Blindlb.6@642 Electricians', Association list 806.106.106.108 Fence Staples, Plain, \$2.25; Gal-
Atkins' Hack Saw Blades A A A25%	Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$1815&10% Garden Tool Sets—	Shot— Drop, up to B, 25-lb, bag\$1.65 Drop, B and larger per 25-lb, bag, \$1.90	vanized . \$2.5: Poultry Netting Staples
Disston's: Concave Blades	Ft. Madison Three Plows. Hoc. Rake and Shovel	Buck, 25-lb, bag	Dick's 30°
mack Saws, Nos. 113, 180, complete,	Suell's Cannon's Diamond Point \$\frac{1}{2}\text{gro}, \text{\$\text{\$\frac{3}{2}\$}\text{\$\frac{3}{2}\$	Sieves and Sifters— Hunter's Imitation	Stocks and Dies— Blacksmiths'
Goodell's Hack Saw Blades. 40&742 Griffin's Hack Saw Frames. 35&5&10 Griffin's Hack Saw Blades. 35&5&10 Springfield Mach. Screw Co.: Diamond Hack Saw Blades. 35 Diamond Hack Saw Frames. 50% Star Hack Saws and Blades. 15&10 Sterling Hack Saw Blades. 35 Sterling Hack Saw Frames. 30&10&5%	Regular list	per gro. \$12.00@12.50 Buffalo Metallic Blued, S. S. Co., \$\pi\$ gr.: 14&16 \$13.20 \$13.50 \$14.40 Shaker (Barler's Pat.) Flour Sifters.	Green River. 259 Lightning Screw Plate. 259 Little Giant. 259 Reece's New Screw Plates. 259 Stone—Scythe Stones—
Barnes' No. 7, \$15	Genuine 58&10 1 1 1 1 1 1 1 1 1	Per doz. \$2.00. 20% Sieves, Seamless Metallic Per dozen. Mesh 14 16 18 20 Iroh Wire \$1.05 1.05 1.10 1.20	Chicago Wheel & Mfg. Co.: Gem Corundum, 10 in., \$8.00 pgro,, 12 in., \$10.80.
with boring attachment, \$2020%	Plate	Tinned Wire. \$1.15 1.15 1.20 1.39	Less than gross lots

- P	21112 2111	ON MUD	1221
PIRE Mfg. Co., 1901 list; Black Diamond S. S., 9 gro. \$12.00 Lamoille S. S., 9 gro. \$11.00 White Mountain S. S. 9 gro. \$9.00 Green Mountain S. S. 9 gro. \$9.00 Extra Indian Pond S. S. 9 gro. \$7.50 No. 1 Indian Pond S. S. 9 gro. \$7.50 No. 2 Indian Pond S. S. 9 gro. \$7.50 No. 2 Indian Pond S. S. 9 gro. \$1.50 Leader Red End S. S. 9 gro. \$4.50 Emery and Corundum, 10 in. 9 gro. \$9.00 Pure Corundum, 10 in., 9 gro. \$12 Crescent \$7.00	Tanks, Oil— Emerald, S., S. & Co30-gal, \$4.50 Emerald, S., S. & Co60-gal, \$4.52 Queen City, S., S. & Co30-gal, \$3.65 Queen City, S., S. & Co60-gal, \$4.50 Tapes, Measuring—	American 3-Ply Hemp, 1-lb. Balis	Nickel Plate Surface; No. 1001 Nickel Plate, Single Surface, \$3.25 Glass Surface; Glass King, Single Surface, open back \$3.25 Enamel Surface; Enamel King Single Surface youts
Leader Red End S. S. & gro. 34.50 S. Emery and Corundum. 10 in gro. 59.00 Pure Corundum. 10 in gro. 512 Crescent	American Asses' Skin. 40&10@50% Patent Leather. 25@30&5% Steel	2, 3, 4 and 5-Ply Jute, 15-15. Balls Balls Mason Line, Linen, ½-1b. Bls. 46e No. 265 Mattress, ¼ and ½-1b. Balls Balls Solution Bills Balls Solution Bills Solution Bills Solution Bills Solution Bills Balls Solution Bills Balls Solution Bills Balls Balls Solution Bills Solution Bills Solution Bills Balls Balls	Enamel King, Single Surface, renti- lated back. \$3.25 Washers —Leather, Axle— Solid \$0.61004, Suc. 10%, Patent 90, 90, 90, 65%, Coil: 74, 1 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1
Oil Stones, &c.— Chicago Wheel & Mfg. Co., 1901 list: Gem Corundum Oil, Double Grit.55%	Favorite, Ass Skin	Vises— Solid Box60&10@60&10&10% Parallel— Athol Machine Co.: Simpson's Adjustable	Iron or Steel
Double Grit	Metallic	Standard 35 Columbian Hdw. Co. 40 40 40 40 40 40 40 40	### Per lb. F4(22) ### Per lb. F4(22) ### Oil Finish
Rosy Red Washita, 4 to 8 in. 604 Washita St., Extra, 4 to 8 in. 504 Washita St., No. 1, 4 to 8 in. 504 Washita St., No. 2, 4 to 8 in. 304 Lily White Slips 904 Washita Slips, St. 904 Washita Slips, St. 2 904 Washita Slips, No. 2 104 404 Washita Slips, No. 2 104 404 Washita Slips, No. 2 104 404 Mashita Slips, No. 2 104 404 Mashita Slips, No. 2 104 404 Washita Slips, No. 2 104 404 Washita Slips, No. 2 104 404	headed, %-inch and larger per 100 lbs. \$3.00 Thermometers— Tin Case80.610@80.610.65% Ties, Bale—Steel Wire Single Loop80.62½%	Fisher & Norris Double Screw. 15&10	Per ton, f.o.b. factory: Eastern District\$25.00 Southern Territory.\$19.006220.00 Western and Central Districts\$20.00621.00
India Oil Stones (entire list)334% Quickcut Emery and Corundum Oil Stone, Double Grit	Monitor, Cross Head, &c70% Brick Ties— Niagara Brick Ties	Clincher	Wheels, Well— 8-in., \$1.59@1.55; 10-in., \$1.65@ 1.70; 12-in., \$2.25@2.35; 14-in., \$3.40@3.50. Wire and Wire Goods— Bright and Annealed:
Sand Stone	Tinware— Stamped, Japanned and Pieced, sold very generally at net prices. Tips, Safety Pole— Covert's Saddlery Works	Vulcan's 490/45 / Combination Pipe. 550/69 / Prentiss 20/6/25 / Sargent's 20/6/25 / Smith & Hemenway Co.; 40 / Jewelers 33/5 / Snediker's X. L. 33/5 /	6 to 9
Hones Grit Carving Knife 50 V Natural Grit Carving Knife Hones Goz \$3.00 Quick Edge Pocket Knife Hones doz, \$2.50 Mounted Kitchen Sand Stone, 200 doz, \$1.50 Stoners, Cherry	See Benders and Upsetters, Tire.	Stephena'	10 to 14 72\\(\frac{1}{2}\)\(\frac{1}\)\(\frac{1}{2}\)\(\frac{1}\)\(\frac{1}{2}\)\(\frac{1}\)\(\frac{1}{2}\)\(\frac{1}\)\(\
Enterprise25@30%	Stowers Fork Pulleys	Wood Workers-	10 to 14
Stoppers, Bottle— Victor Bottle Stoppers p gro, \$9.00	Atkins' Cross Cut Saw Tools40% Simonds' Improved33% Simonds' Crescent25%	Massey Vise Co.: Lightning Grip	27 to 36
Stops Bench	Simonds' Crescent	Perfect 15% Wyman & Gordon's Quick Action 6 in., \$6.00; 9 in., \$7.00; 14 in., \$8.00. Miscellaneous— Bignall & Keeler Combination Pipe Vise 60&10%	6 to 14
Chapin-Stephens Co	Traps—Fly— Balloon, Globe or Acme, doz.	Vise Holland's Combination Pipe. 60c40% Massey's Quick Action Pipe. 40% Parker's Combination Pipe: 87 Series. 60%	60&10@60&10&10% Brass, list Feb. 26, '9630&5% Copper, list Feb. 26, '9615%
Chapin-Stephens Co	\$1.15@\$1.25; gro\$11.50@12.00 Harper, Champion or Paragon, doz. \$1.25@1.40; gro. \$13.00@13.50 Came— Oncida Pattern75&10@75&10&5%	Wads—Price per M.	Cast Steel Wire
Covert's Saddlery Works	Newhouse 15@45&57 Hawley & Norton 55% Victor and Oneida 70&10@70&10&57 O. C. Jump (Blake Pat.). 60&5@60&10 Mouse and Rat- Mouse, Wood, Choker, doz. holes	B. E. 11 up	Wire Cloth and Netting— Galvanized Wire Netting— 80&15@80&17½% Painted Screen Cloth, 100 ft., \$1.20
Excelsior Stretcher and Tack Hammer Combined, & doz. \$6.9020% Stuffers, Sausage—	Mouse, Round or Square Wire.	P. E., 8 1.50 P. E. 7	Nos. 2, 21/2 & 3 Mesh, sq. ft. 3 & Nos. 4 and 5 Mesh, sq. ft. 31/4
Enterprise Mfg. Co25@25&7/4% National Specialty Co., list Jan. 1: 1902 — 30&5% Sweepers, Carpet—	doz. 85@90 ¢ Marty French Rat and Mouse Traps (Genuine): No. 1, Rat, each \$1.21; № doz. \$13.25 No. 3, Rat, № doz. \$6.50; case of 50 \$5.75 doz.	Ely's B. E., 11 and larger \$1.70@1.75 Ely's P. E., 12 to 29\$3.00@3.25 Ware, Hollow— Cast Iron, Hollow— Stove Hollow Ware;	No. 6 Mesh, sq. ft
National Sweeper Co.: 39 doz. Auditorium, Roller Bearing (25 in. case), Nickel	No. 3½, Rat, \$\emptyset\$ doz. \$5.25; case of 72 \$\emptyset\$ gro. \$4.70 doz. No. 4, Mouse, \$\emptyset\$ doz. \$3.85; case of 150 \$3.00 doz. No. 5, Mouse, \$\emptyset\$ doz. \$3.00; case of 150 \$2.25 doz.	Enameled 506155&10% Ground 556460&10% Plain or Unground 606165&10% Country Hollow Ware, per 100 lbs. \$2.7563.00	Agricultural 75&10@75&10&10. Alligator or Crocodile. 70&10@75% Baxter Pattern 8 Wrenches 70&5@70&10% Drop Forged 8 45@45&5% Acme
nnishes, full McKel. 224.00 Marion Queen, Boller Bearing, full Nickel 224.00 Monarch, Roller Bearing, N'kel. 322.00 Monarch, Roller Br'g, Jap'ned. 320.00 Transparent, Roller Bearing, Plate Glass Ton, Nickel 336.00	Trimmers, Spoke Wood's E I	White Enameled Ware: Maslin Kettles	Alligator Pattern 70% Bull Dog 70% Bemis & Call's: Adjustable S 80%
Marion Queen, Roller Bearing, full Nickel \$24,00 Monarch, Roller Bearing, N'kel, \$22,00 Monarch, Roller Bearing, Plate Glass Top, Nickel \$36,00 Monarch Extra, Roller Bearing, Plate Glass Top, Nickel \$36,00 Monarch Extra, Roller Bearing, (17-in, case), Nickel \$36,00 Monarch Extra, Roller Bearing, (17-in, case), Japanned \$33,00 National Queen, Fancy Veneers, \$27,00 Perpetual, Regular B'r'gs, Nik, \$20,00 Perpetual, Regular B'r'gs, Jap. \$18,00 Triple Medal \$33,00	den Trowels. 35% Kohler's Steel Garden Trowels, 5 in. § gro. \$4.89 Kohler's Steel Garden Trowels, 6 in. § gro. \$6.00 Never-Break Steel Garden Trowels.	Enameled Agate Nickel Steel Ware 50&20% Agate Nickel Steel Ware, Specials 1 Tron Clad Ware 70&10 1 Tron Clad Ware 70&10	Bemis Pipe
Triple Medal	Woodrough & McParlin, Plastering 25%	Lava, Enameled	Elgin Wrenches, \$\psi\$ doz \$6.25 Elgin Rethreading Attachment, \$\psi\$
Tacks, Brads, &c	B. & L. Block Co.: New York Pattern	Avery Spiders and Griddles 65665.659	doz. \$6.25 Elgin Extra Dies and Jaws. 50 % Gem Pocket. 30 %
New List, April 1, 1905. Carpet Tacks	Daisy Stove Trucks, Improved Pat- tern	Avery Kettles	Hercules
Gimp Tacks. Lace Tacks. Trimmers' Tacks. Looking Glass Tacks. Bill Posters' and Railroad Tacks	Galvanized Wash Tubs (8., 8. & Co.): No. 1 2 3 10 20 30 Per dox., net.\$5.70 6.30 7.20 6.60 7.20 8.10 Twine, Miscellaneous— Flax Tioine: BC. B.	Warmers, Foot— Pike Mfg. Co., Soapstone40@40&10% Washboards— Solid Zinc: Crescent, family size, bent frame 33, 25	Vulcan Chsin
Hungarian Nails Z Common and Patent Brads Z Trunk and Clout Nails S	No. 9, ½ and ½-lb. Balls. 22@2\$¢ No. 12, ¼ and ½-lb. Balls. 18@20¢ No. 18, ¼ and ½-lb. Balls. 16@18¢ No. 2\$, ¼ and ½-lb. Balls. 16@18¢ No. 36, ¼ and ½-lb. Balls. 15@17¢ Chalk Line, Cotton ½-lb.	Red Star, family size, stationary protector	Staples. Hooks, &c., list March 17, '92
Straight Weights. An extra 5% is given on Star Weights. and an extra 10d5% on Standard Weights. ** Miscellaneous— Double Pointed Tacks	Cotton Mope, 6, 9, 12 and 15 lb. to doz	ary protector	Yokes, Ox, and Ox Bows Fort Madison's Farmers' & Freighters'
list	American 2-Ply Hemp, ¼ and ½-lb. Balls	Brass Surface: Brass King, Single Surface, open back	Sheetper 100 lbs.\$7.75@8.00

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL-Bar Iron from store-Refined Iron: 1 to 134 in. round and square. 1½ to 4 in. x 34 to 1 in. 1½ to 4 in. x 34 to 5 io. 1½ to 4 in. x 34 to 5 io. 1½ to 4 in. x 34 to 5 io. 20 de Angles: 21 to 4 in. x 34 to 5 io. 22 to 4 io. 23 to 5 io. 24 to 5 io. 24 5 co in. x 34 io. 25 to 4 io. 25 to 4 io. 26 to 27 1½ to 3 lb. 12 found and mpan. Angles: 8 in. x ½ in. and larger. 8 in. x ½ in. and larger. 8 in. x ½ in. x ½ in. x ½ in. 1½ to 2½ in. x ½ in. and thicker. 1 to 1¼ in. x 3-16 in. 1½ to 2½ in. 3 in. and larger. Beams. Channels, 3 in. and larger. Bands—1½ to 6 x 3-16 to No. 8. "Burden's Best," Iron, hase price. Burden's Hest," Iron, hase price.

Merchant S	teel from St	ore-
		per m
essemer Machinery	***************	1.95€
oe Calk, Tire and Sleig est Cast Steel, base pri	h Shoe	2.50@3.00¢
est Cast Steel, base pri	ce in small lots	70

Sheet Iron from Store-

Black.

	One Pass, C.R. R. C. Soft Steel. Cleaned
No. 14	P n 2.40. 2.70¢
Nos. 18 to 21	P n 2.75. 2.50¢
No. 27	P n 2.90 8.20¢
No. 28	P n 3.00 8.20¢

Russia, Planished, &c.

ment
Galvanized

Galvanized.	
Nos. 14 to 16	m, 3.05
Nos. 22 to 24	m, 3.45
No. 27	m, 3.90
No. 27	P , 4.15

METALS-

Tin Plates-

				-				
American	Cha	arco	al I	Plate	98	(per	bo	X.)
A.A.A. Charcon	al:							
IC, 14 x 20 IX, 14 x 20								5.9
IX, 14 x 20								7.2
A. Charcoal:								
TC 14 v 90								50

I			Bessemer-
	1 X 14 x 20	*********	 5.20

1X, 14 x 20	
American	
TC 90 = 99	

X, 20 x 28	
Co	opper-
ke Ingot	
sting	15 %@ 15% e

	Sheet Copper Hot Rolled, 16 oz	ė
	" 14 " " 200	ò
	Sheet Copper Cold Rolled, 1¢ ? n advance over Hot Rolled.	
	Sheet Copper Polished 20 in. wide and under, 1¢ ad-	
ı	vance over Cold Rolled.	
ı	Shoot Conner Folished over 90 in wide 94 advance	

Sheet Copper Polished over zw in. which over Cold Rolled. Over Cold Rolled. Bottoms, Its and Flats 23¢ basis Hungarian. Planished Copper, I¢ w ib more than Polished.

Seamless Brass Tubes-

01		Ne	t.		Base Price 20¢							
Stubs' W G.	34	5-16	36	7-16	36	9-16	56	34	74	1	134	1%
12 13 14 15 16 17 18 19 20 21 22	51 60 62 64 69	81 33 93 83 49 51 59	28 28 29 29 29 31 33 35	28 28 28 23 29 29 29 29 30 33 35	27 27 27 27 27 23 28 28 30 31	27 27 27 28 28 28 28 31	26 27 27 27 27 27 27 27 27 27 28 23 27 27 28	26 27 25 25 25 26 26 26 27 23 31	25 25 25 25 25 25 26 26 26 27 28	25 25 25 25 25 26 26 26 26 27 28	20 21 21 22 23 24 25 26 27 28 31	20 20 21 21 22 23 24 25 26 27 28
24 25	79 84	69	51 54	46 49	44	49	42	41	89 49	38	33	39

Iron Pipe Sizes-Brass

Tin-- 14 14 34 14 34 1 114 114 2 24 3 34 4 4 15 5 6 inch
Straits Pig. 28 27 22 21 29 29 20 20 20 21 22 24 26 27 6 9 in

Brazod Brass Tubing.

Discount from List June 6, 1898, 25%. Bronze and Copper Tubing advance on Brass List 3¢

95 Roll and Sheet Brass—

Discount from List June 6, 1898, 20%.

Spelter-

6.30	Western	P 10 6%@6%¢
s-Bessemer-		Zinc.
5.90	No. 9, base, casks, P' n 8	¢ Open₽ № 8½¢

Solder.

No.1			P 10	19@19%¢
Prices of Solder indicated cording to composition.	by	pr!vate	brand	vary ac-

Antimony-																								
Cookson								 		* 1			 	**		 	. 1	P	m	9		@	114	
U.S		**	*				 *	 *												8	4	en s	14	0

Aluminum-

1 Aluminum for remelting	ed over	99%	pure),	in	ingot
Small lots.	 			· · · ·	m 37¢

Old Metals.

0.0 0.000	
Dealers' Purchasing Prices Paid in New York.	
Heavy Copper 1314 #	
Light and Tinned Copper # m 12 @	
Heavy Brass 18 16 81/2 0	
Light Brass P h 7 c	
I end P 114 15	į.
Tea Lead # #3.90 @	l
Zinc # 15 4 2	l
No. 1 Pewter # h 21	i
No. 2 Pewter	
Tin Plate Scrap	i
Wrought Scrap Iron @ gross ton \$15.00@15.50	i
Heavy Cast Scrap @ gross ton \$13.00@13.50	i
Stove Plate scrap F gross ton \$12.00@13.50	į

The Metal Worker Plumber and Steam Fitter

PUBLISHED EVERY SATURDAY MORNING Established 1974

REPRESENTING THE

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